

AMERICAN RESEARCH CENTER IN EGYPT

# NEWSLETTER



THE SPHINX CLEARED FROM THE SAND.

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THE ARCE NEWSLETTER

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QASR IBRIM -- 1986 SEASON  
Field Report

The 1986 season at Qasr Ibrim, in Lower Nubia, lasted from December 17, 1985 through April 6, 1986. Excavations began on the 22nd of December and continued through the 13th of February, 1986. On-site analysis continued until the 18th of March, 1986. The field work was directed by Dr. John Alexander (Director) of Cambridge University and Dr. Boyce Driskell (Assistant Director) of the University of Kentucky, United States. Excavations were under the supervision of the two directors as well as Dr. Graham Connah of the University of New England, Australia. These three archaeologists supervised work in four areas (see map 1) at Qasr Ibrim including the cathedral plazas (area 1), the north peninsula (area 2), the eastern terraces (area 3), and the southeastern terrace (area 4).

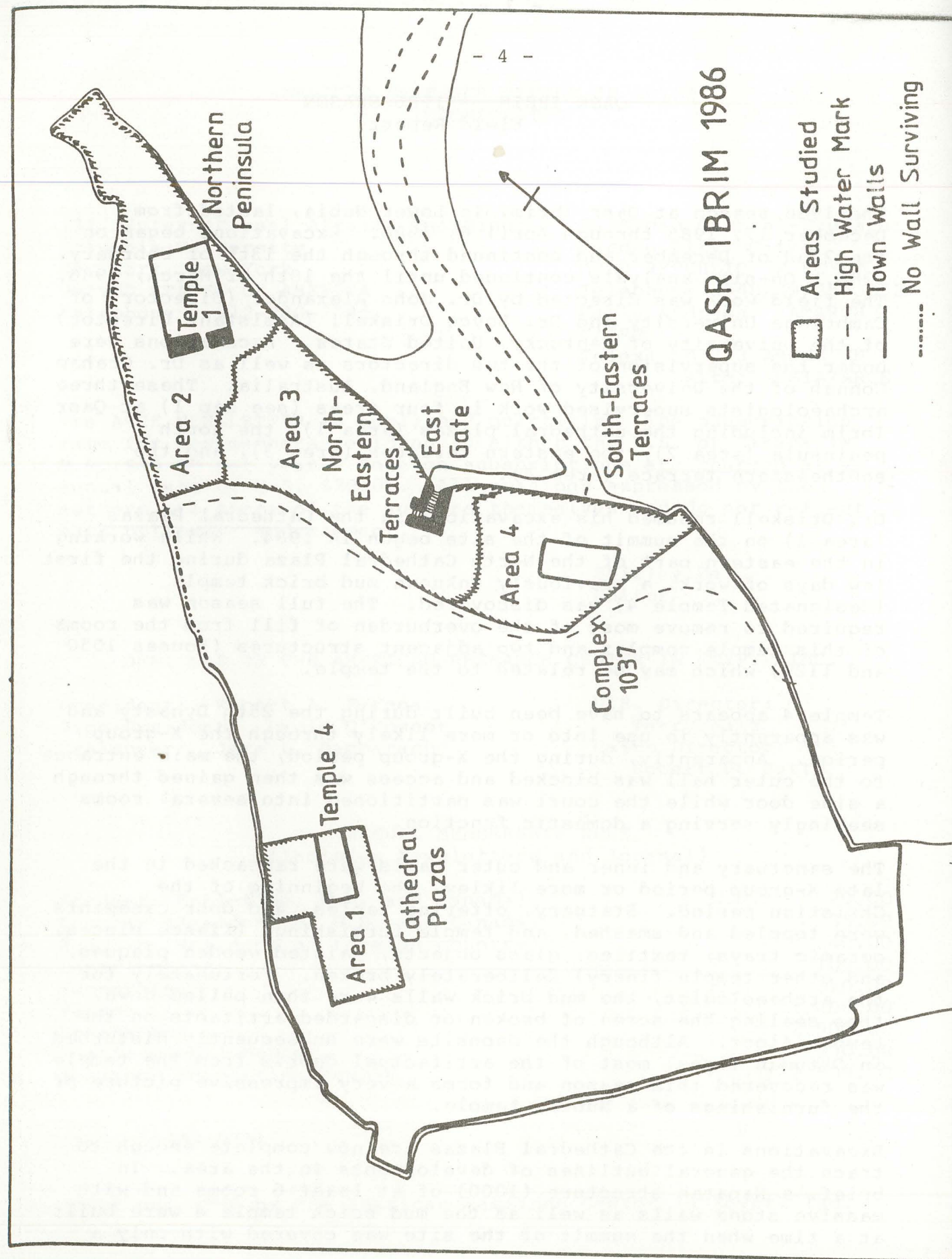
Dr. Driskell resumed his excavations in the Cathedral Plazas (area 1) on the summit of the site begun in 1984. While working in the eastern part of the North Cathedral Plaza during the first few days of work, a previously unknown mud brick temple (designated Temple 4) was discovered. The full season was required to remove most of the overburden of fill from the rooms of this temple complex and two adjacent structures (houses 1050 and 1129) which may be related to the temple.

Temple 4 appears to have been built during the 25th Dynasty and was apparently in use into or more likely through the X-group period. Apparently, during the X-group period, the main entrance to the outer hall was blocked and access was then gained through a side door while the court was partitioned into several rooms seemingly serving a domestic function.

The sanctuary and inner and outer halls were ransacked in the late X-group period or more likely, the beginning of the Christian period. Statuary, offering tables, and door casements were toppled and smashed, and temple furnishings (fiance pieces, ceramic trays, textiles, glass objects, painted wooden plaques, and other temple finery) deliberately broken. Fortunately for the archaeologist, the mud brick walls were then pulled down, thus sealing the scree of broken or discarded artifacts on the temple floor. Although the deposits were subsequently disturbed in Ottoman times, most of the artifactual debris from the temple was recovered this season and forms a very impressive picture of the furnishings of a Nubian temple.

Excavations in the Cathedral Plazas are now complete enough to trace the general outlines of developments in the area. In brief, a Napatan structure (1000) of at least 6 rooms and with massive stone walls as well as the mud brick temple 4 were built at a time when the summit of the site was covered with only a





Map 1

thin layer of soil. Later, in Meroitic and X-Group times, domestic structures developed around these. All of these structures were toppled down and filled in in about 700 A.D. in preparation for construction of the Cathedral. The large stone-built Meroitic Temple 2 was razed for building stone and the site took a new look dominated by the Cathedral and its open plazas. The area around the Cathedral was once again leveled in preparation for building in the 15th or 16th Centuries when the Ottoman garrison holders built new houses across all the area of the plazas and converted the Cathedral to a mosque.

While excavations in the Cathedral Plazas and on the summit of the site are on-going objectives, a limited, but important aim of the 1986 season was to complete the study of those parts of the site which had emerged from the lake and which might, in the future, be reflooded. Since the water had dropped below the whole length of the fortress curtain (or girdle) wall making the whole flooded area available, it was possible to complete the study and to offer an outline culture history for the area. The main area flooded had been the low lying Northern Peninsula (area 2), Eastern Terraces (area 3) and the Southeastern Terrace (area 4), each of them offering major excavation problems.

Dr. Alexander concentrated on areas 2 and 3. The Northern Peninsula (area 2) contained the ruins of a temple (Temple 1) and a cemetery, while the Eastern Terraces (area 2) contained the great East Gate (314), the street leading to it and buildings beside it.

Temple 1, dominating the northern spur of the fortress, and recently submerged in Lake Nasser, has long been known but was not investigated thoroughly prior to inundation. Low water levels permitted additional investigation which revealed that the temple was built over a cemetery of rockcut graves containing 1-3rd century A.D. pottery. Built of cut stone in traditional Egyptian style, it was aligned to include three fine shaft graves. The central one was 4m deep and 2.4m square, changing direction twice. Pottery below a wall and floor of the temple, as well as in the burial chamber, was of X-group date.

There seems little doubt that on the Eastern Terraces of the site there was little domestic occupation until the fortification of the hilltop in the last centuries B.C.; the eastern terraces were probably thinly covered with rubbish and the northern peninsula was, if used at all, a cemetery.

With the fortification of the site the importance of this area increased and, especially in Meroitic and X-group times, it was all in use. The Eastern Terraces, after the resiting of the main fortress gate in this area, was used for domestic settlement in both the Roman and Meroitic periods. Evidence from later periods had been washed away but the creation of man-made terraces on the



hillside above the Gate suggests that it was used for housing. The Roman Fortress Gate showed evidence of much alteration and at least two major changes took place. The first was the creation of subterranean guard rooms behind the Gate and an approach road to the interior doorway with one 90 degree and one 180 degree bend in it. The second was the silting up of the original narrow rock cut corridor and its replacement in Late Christian times by a broader roadway at a higher level. This remained in use through the Ottoman occupation. No attempt seems to have been made to utilize the Eastern Terraces during the Islamic period although the Northern Peninsula was completely built over.

The excavation of 1037 house and of adjacent areas 1108W, 1109/0, and 1110N in the Southeastern Terrace (area 4) was undertaken by Dr. Connah. The area produced evidence dating from Napatan to Islamic times. However, most of the structural remains were from the Meroitic through Early Christian periods. The excavation of the large, well-built house, possibly an elite residence, was used for most if not all of the Meroitic, X-Group and Early Christian periods. The excavations produced an amazing array of artifacts including textiles and other organic remains in spite of its inundation during the highest levels of the lake's waters.

In summary, excavations have now proceeded to the point in the Cathedral Plazas where most of the major architectural features are thought to be known and the basic sequence of culture history is understood. However, a considerable amount of detailed excavation of selected structures is still required. In regards to the lower areas of the site, we are happy to report that all the areas likely to be reflooded when the lake waters rise again have now been sampled and their outline cultural history established. The on-site analysis of certain artifact categories and a brief statement concerning the artifacts recovered during the work follows.

#### Pottery Analysis (by Pamala Rose)

Following the standard procedures for dealing with the pottery from Qasr Ibrim all sherds recovered from the 417 contexts excavated this season were washed and catalogued according to ware type (i.e., a combination of fabric, surface treatment, and decoration). The analysis of the percentages of sherds of various ware types occurring in any single context then allows that context to be closely dated, often to within a 50 year period. This season the periods mainly dealt with in this manner were Early Christian, X-Group, Meroitic and Roman, but towards the end of the season a substantial amount of Napatan pottery was recovered from several deep soundings on the Eastern Terraces. This material has been reserved for detailed study next season and it is hoped that the combination of this pottery with that found in the 1984 excavations in the vicinity of the Taharqa

temple will enable a comprehensive corpus of Napatan pottery of the XXVth dynasty and later to be produced.

This season's pottery also included about 60 complete or substantially complete vessels, or vessel types that were previously unknown. These were catalogued separately in detail on record cards, drawn and photographed. Most of the intact vessels were from the Early X-group and Roman periods, and the excavations of Temple 4 produced a number of new types of lamps, bowls and offering vessels, some of which were decorated with Meroitic motifs.

#### Botanical and Zoological Remains (by Peter Rowley-Conwy)

Animal bones for the 1986 season confirm one feature noted in 1984: most periods have considerable numbers of cow, sheep, goat and pig; while in the Meroitic period dependence on the cow was almost total. Recovery experiments show that bone recovery is not very good, but the increase in cattle in the Meroitic cannot solely be due to this, and must represent a very considerable dependency upon cattle. Wild mammals are represented by a very few bones of gazelle and hartebeest.

Plant remains confirm that most crops traditionally grown in the summer (sorghum, cotton, various beans, sesame, etc.) appear in the first few centuries A.D., but not (as previously thought) all at precisely the same time. Cotton seed (probably imported) appears in the later Roman period (first century A.D.). Sorghum, and probably black-eyed pea appear early in the Meroitic. A hexaploid wheat (perhaps bread wheat) appears in the later Meroitic. By X-group times the full agricultural range was present which continued until the site was abandoned in A.D. 1811, with the exception that durra (sorohum bicolor var. durra) was added around A.D. 1000.

#### Leather Products and Off-Cuts (by Chris Caley)

A total of 488 items of leather were recovered and analysed including shoe items, some comprising multiple pieces, of which 31 items were untanned and the balance were tanned. The bulk of the material came from the excavations in area 1 with several pieces from the previously flooded area 4. Of the material from the dry deposits it is noteworthy that the bulk were found in Temple 4.

The non-shoe items catalogued included rahat girdle fringes and tassels; bags, one with a serrated edge, bindings (usually rawhide) and cords, a hair ornament, fragments of a decorated book cover, slings, door pivots, an ingenious looped belt and, as usual, many unidentifiable items. The common species included



cattle, sheep and goat, with a very small percentage of unidentifiable canid, gazelle/antelope, reptilian and camel/hippo-type skins.

#### Textiles (by Nettie Adams)

Textile studies were conducted using the same procedures established by Elisabeth Crowfoot in 1976; that is, analysis and recording of every excavated fragment, and cataloguing specimens needing further study or suitable for museum display. Almost 4000 textiles were recorded from area 1. This included 2,672 specimens from temple 4, of which 20 were found to be extraordinary in terms of weaving and aesthetic quality. These were all of cotton, with very fine spinning and weaving, and having tapestry-woven designs derived from Egyptian iconography or of a geometric character.

The efforts of novice weavers produced 50 specimens from this same area. These little complete weavings, all too small to have any utilitarian use, were made with unevenly spun yarn and the weaving was generally coarse and uneven. It seems clear that the fine temple textiles served as models for some of the more advanced students, who employed some of the same designs in their samplers.

An unexpected deposit in the wet area 4 yielded 600 textile fragments of Meroitic date. A further 4,732 specimens were recorded from the 1982 season thus finishing the backlog of unrecorded textiles at the site.

#### Basketry (by Boyce Driskell)

While a few fragments of basketry came from the wet areas (2, 3, and 4), most of the baskets and fragments which could be analyzed in any detail were from area 1 on the site's summit. In all, 409 baskets or fragments from this area were analyzed according to the system of attribute analysis established in 1980. Most of the basketry was fragmentary and most fragments were from large utility storage baskets. However, a few specimens were more intact and the few well-preserved baskets were saved for museum display.

#### Other Artifacts (by Peter French)

Regarding other objects recovered in 1986, the quality of preservation varied greatly. Three of the four areas excavated this season had been under water before falling lake levels made them available again. A few artifacts other than pottery sherds survived this emersion, the principle ones being of glass and

metal, the latter chiefly in seriously corroded condition. Most commonly found were arrowheads, small cosmetic implements and coins. One large surviving object of stone was part of the lower half of a statue of the Classical period which may prove to join a torso found in an earlier season and now in Cairo.

Excavation in area 1 proved much more productive of objects, since it had not been affected by water. Below the uppermost levels the contents of the temple discovered in the course of the work proved to date mostly from Meroitic and X-Group times and to be of exceptional interest. The destruction wrought among the temple's possessions left behind many hundreds of fragments of glass vessels and of faience and other glazed wares. Work to restore these as far as possible will take many months. In addition, a number of wooden plaques painted with snakes, antelopes, and other creatures came to light; for the most part, these had not been damaged but many are so dirty that only expert cleaning will reveal their subjects. The statuery of the temple had also been smashed by substantial parts were recovered of an almost full-sized female statue and of a large hawk, as well as broken statuettes of Isis, Osiris, Ta-wrt, another hawk and a lion. The lower part of a pottery statuette of Bes was also found. Three pottery trays had painted subjects chief of which were snakes.

Some further wooden fragments appear to derive from boxes and their lids and some of these had been burnt. A small but interesting series of probably votive articles included a model bow and spear head together with part of a full sized arrow shaft and two archer's looses. In an adjacent room, a cache of small mud objects included model vessels and altars as well as a curious model shrine depicting Khnum, Satet, and Anuket.

Finally, a series of large and small offering tables and two stone altars also formed part of the temple furniture. The study of all this material will take a considerable time but should be most revealing of cult practices and equipment in X-Group Nubia.

#### Acknowledgements

Financial grants to support the 1986 season at Qasr Ibrim included a basic continuing grant from the Egypt Exploration Society, our sponsors, as well as grants from the Australian Research Council and the American Research Center in Egypt. We are very grateful for this support. We would also like to express our deepest gratitude to the Egypt Antiquities Organization for its support including the supplying of the boats used at Qasr Ibrim. We would like also to individually thank Dr. A. Kadry, Chairman, for his continued support. Thanks also go to Mr. M. Balboosh and Mr. M. Ali for their kind consideration in our requests for Inspectors. Mr. Abdeen Siam has, as always been



extremely kind and helpful to our expedition. Mr. Moheedeem Mustafa in Aswan and Mr. Attia Radwan in Abu Simbel have also helped the expedition in many ways. We would also like to express our sincere thanks and kind regards to our two Inspectors, Mr. Abd el Hakeem Karar and Mr. Magdi Abdeen, both of Aswan. It was a pleasure to work with these two men. Without the help of all of these men from the Antiquities Organization, our expedition could not have been a success.

Boyce Driskell  
John Alexander  
(with other contributions as noted)

## EXCAVATIONS AT KOM EL-HISN, 1986

### Introduction

A dominant theme in biographical inscriptions in tombs of Old Kingdom nobles is the active role the pharaohs played in shaping the settlement map of Egypt. As Badawy noted, "Nothing is less accurate than to picture the pharaoh as a hieratic ruler, son of Re' and himself a God . . ., keeping aloof from his people. . . ." (1967: 103). Particularly in the Old Kingdom and First Intermediate Periods, these inscriptions suggest, the pharaohs personally directed the settlement of Egypt, and they did so for a variety of motives, including the consolidation of royal power, the stimulation of economic development, and the defense of the frontiers.

These aspects of ancient Egyptian settlement practices and patterns are particularly interesting from the perspective of comparative analyses of early civilizations, because Egypt has long been considered different from other early civilizations in its settlement patterns. Compared to ancient Sumer and Akkad, for example, Early Dynastic and Old Kingdom settlements seem small and undifferentiated, and they do not seem to have been spatially arranged in the kind of multi-level hierarchies of economic and political power typical of Mesopotamia. The importance of these apparent differences has mainly to do with the fact that, other than documentary evidence, settlement patterns are the most accessible and direct evidence we have about the social, political, and economic forces that determined these ancient histories.

It is within the context of these considerations that in 1984 we began a research project at Kom el-Hisn (Figure 1), a relatively large West Delta settlement that appears to have been established in the Old Kingdom and which continued in occupation into Ramesside times. After an initial season in 1984 (Wenke and Redding 1985, Wenke 1986), we returned in the summer of 1986 for 11 weeks of excavations, surveys, and research.

Our research has been designed to relate the economy, social organization, and other features of Old Kingdom Kom el-Hisn to the national Old Kingdom "state." We were specifically concerned with establishing the kinds of products produced at or imported to Kom el-Hisn and the patterns of variability in its architecture and artifact distributions that may reflect socio-economic differences. Generally, we have been trying to determine the extent to which Kom el-Hisn was integrated into the national political and economic system.



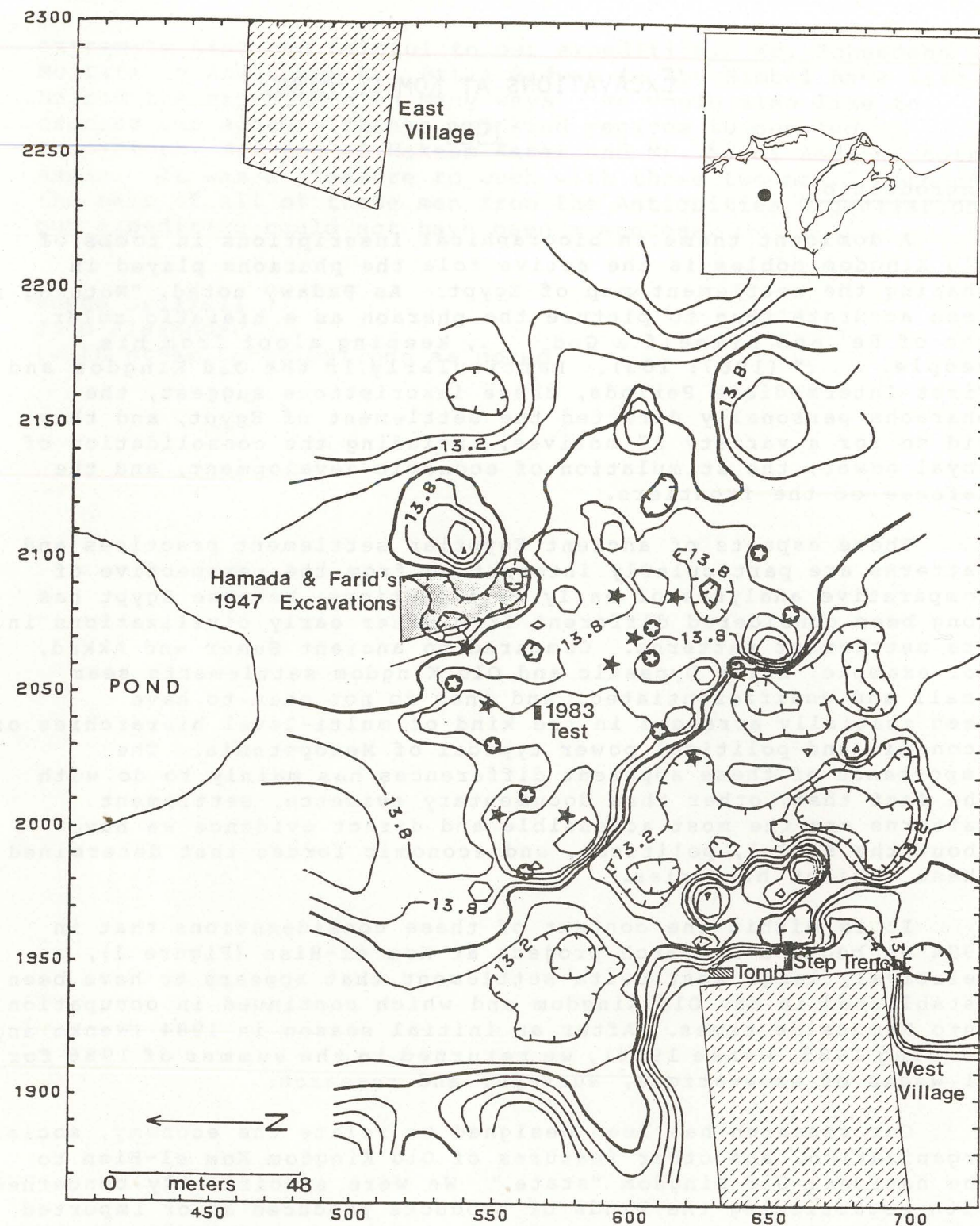


Figure 1. Topographic map of Kom el-Hisn. Excavations in 1984 are indicated by black stars, those of 1986 by white stars on black background. Locations are approximate.

We chose Kom el-Hisn because it is directly relevant to these questions of settlement analysis and socio-political organization. It is one of the few known, well-preserved, archaeologically accessible, Old Kingdom, provincial towns in all of Egypt; also its location in the Delta is important: although some areas of the the Delta had been settled long before the Old Kingdom, its administrative and economic connections to the rest of Old Kingdom Egypt are poorly understood. Documentary evidence (Badawy 1967: 105; Goedicke 1969) suggests that settlement pattern evidence from the Delta may be a particularly illuminating reflection of variations in the political, economic, and military fortunes of the Egyptian state.

#### Research Results

Kom el-Hisn has been investigated by archaeologists for almost a century (reviewed in Wenke and Redding 1985), but our 1984 excavations were the first published work on its Old Kingdom settlement. In those excavations we determined that a large area of the site was composed of mud-brick buildings of at least three different occupational periods. Radiocarbon age estimates (Wenke 1986), when corrected, cluster around 2600 B.C., and the pottery assemblage is dominated by wares comparable in many characteristics to those from 5th Dynasty tombs at Giza, Saqqara and Abu Ruash.

In our 1986 season we sought both to expand the scale of our previous excavations and to determine specific aspects of the site's geological and ecological context.

Figure 1 shows our 1986 excavations in relation to previous work. We excavated in 2 X 2 meter units, this being the maximum area over which we felt we could document and follow the complex stratigraphy. All excavated materials were screened, all sherds were saved and analyzed, and sediment samples for floral and other analyses were taken from every excavation unit and level. In addition, we used a hand auger to take hundreds of sediment samples, both in the occupational areas of the site and around it, in order to determine the site's sedimentological history.

#### Architecture

As in our 1984 excavations, most of our 1986 excavation units revealed mud-brick buildings. Our deepest excavation unit reached a depth of almost two meters from the surface of the site and exposed three superimposed levels of construction. The high water table prevented us from continuing excavations here to culturally sterile sediments, which augering revealed are at least .50 cm farther down.



Perhaps the most interesting architecture was revealed in the center of the main occupational area, where we were able to clear a 72 square meter area of articulated mud-brick walls, forming six separate rooms of varying sizes and contents. Although these walls were in some cases only a few centimeters below the present site surface, their preservation was relatively good, and we found many animal bones, pottery vessels, unfired mud "storage" features, and other artifacts with them. Surface topography in this area is such that we believe this particular architectural feature extends over at least 300 square meters. In future seasons we hope to expose the whole complex and analyze thoroughly its construction and associated artifacts and floral and faunal remains.

Another interesting architectural feature was a complex of walls (which we only partly excavated) situated a considerable distance to the northwest of the main known Old Kingdom areas of Kom el-Hisn. The construction methods of these walls--but more importantly their associated ceramics--clearly identify these features as Old Kingdom in age. This evidence, plus samples from our augering and field surveys, strongly suggest that the Old Kingdom settlement at Kom el-Hisn extended far beyond the area in which we have heretofore concentrated our excavations.

#### Ceramics and Lithics

As in our 1984 research, in 1986 we found that most of the ceramics were of the forms and wares associated with Old Kingdom occupations at Giza, Saqqara and other Lower Egyptian sites. Particularly numerous were medium-fired, red-slipped, round-bottom, shallow bowls (we also found some pieces of the classic "Meidum Ware"); another common vessel type was the crudely made, low fired "bread mold" and other forms of vessels in this ware. All sherds from rims or bases were classified and tabulated, and body sherds were separated by wares and weighed.

We are presently conducting extensive statistical analyses to determine if variations in the distribution of ceramic wares and attributes can be matched to some of our ideas about the chronological sequence and functional composition of the site.

The only ceramics not similar to those known from Old Kingdom-First Intermediate Period settlements elsewhere came from several excavation units on the southwest edge of the site. The dominant ceramic form in these deposits is a thin, gray, medium-fired, straight-walled cup or bowl. Inscribed mud-sealings, an amulet, and other artifacts found in these excavations strongly suggest an early Middle Kingdom date.

As in the 1984 season, the majority of lithics recovered in the 1986 season were "sickle" blades and ground stone fragments, but we also found cores and a considerable variety of lithic tools. Many of the blades show evidence of "sickle sheen"; some of the grinding stones appear to have been used to process mineral pigments, possibly ochre.

#### Faunal and Floral Remains

Despite the wet environment of the Delta, bone preservation at Kom el-Hisn is quite good. From materials excavated in 1986 we identified 871 bones, 205 of them from fish, 164 from birds, 6 from reptiles, and 496 from mammals.

The identified fish in the 1986 sample include, in order of importance (as inferred from relative frequencies), Tilapia spp., Synodontis schall, an as yet unidentified marine species of what appears to be a drum, Bagrus bayad, Clarias lazera, Tetradon fahaka, and Lates sp. The reptile remains are all from tortises and a species of soft-shelled turtle. The bird remains have not been identified, other than four fragments of ostrich eggs. The majority of the identified material is from mammals. As in the 1984 sample, the most common mammal taxa are pig (Sus scrofa) and sheep (Ovis aries and Capra hircus). Pigs are represented by 266 elements, and sheep/goats by 166. Thus the ratio of pigs to sheep/goats is 1.6:1, compared to a ratio of 1.9:1 in the 1984 sample. Pigs may have been more important in the diet than even these figures indicate, given that the average pig yields 1.5 times as much meat as the average sheep/goat and that each gram of pork contains 100 more calories than a gram of mutton. In the 1986 sample the ratio of sheep to goats was 1:0.3, whereas in the 1984 sample it was 2:1. We are investigating the spatial distribution of these remains to determine the significance of these different ratios. As in the 1984 sample, only a few cattle bones were identified (11 in 1986). The significance of this in terms of the possible role of Kom el-Hisn as a cattle-breeding center (Wenke 1986) is being assessed. The bubal hartebeest is represented by ten elements. Thirty-six elements of a small equid were found, 30 of them from a single excavation unit, possibly from a single individual. Other mammals represented in the 1986 sample include a canid, a gazelle, a rodent (probably Arvicanthus, and a shrew (Suncus).\*

The floral remains from the site, as reflected in the several hundred float samples and sediment samples we took, have not been analyzed. Materials from the 1984 season, however, showed a predominance of fodder and field plants, and a surprisingly low frequency of cereals--even assuming that most of these materials were charred (and thus preserved) in the course of burning dung-cakes for domestic cooking.



### Epigraphic Materials

We found many fragments of inscribed clay sealings, as well as a stone seal and a stone scarab. These materials (now in the Tanta Museum) were photographed and drawn and are now being identified. Like similar materials from the 1984 season, some of these materials appear to be from the Old Kingdom Period, but some of the materials found on the southwest boundary of the site are of Middle Kingdom age. As noted above, these apparently Middle Kingdom epigraphic materials (and some amulet fragments) were found with ceramics that contrast sharply with those from most other areas of the site.

### Geological Research

We undertook augering, test-trenching, field surveys, and ground checks of satellite imagery to try to establish the geological and ecological context of Kom el-Hisn, particularly with regard to how and when the site was formed and where it was in relation to ancient branches of the Nile. When we have completed our analyses of these data we hope to use this information both to understand better various aspects of Kom el-Hisn and to locate other early sites in the Delta.

### Summary

Our two seasons of excavations at Kom el-Hisn have shown it to be a large, architecturally complex settlement that was occupied during all or most of the "Pyramid Age" of the Old Kingdom and into the Middle Kingdom. Our analyses of the distributions of craft items, buildings, floral and faunal remains, and other evidence are in their early stages, but eventually we hope to relate our findings to important questions about cultural evolution in ancient Egypt. Publication of our results from the first two seasons is planned for 1987.

We hope to return to the site in the spring of 1988 to continue our excavations, this time on a much larger scale and at a time of the year when ground-water levels will allow us to reveal the initial occupation of the site.

### Acknowledgements

For their administrative help and gracious cooperation, we would like to thank Dr. Ahmed Qadry, President of the Egyptian Antiquities Organization, Dr. Mahmoud Abd el-Razziq, Director of Excavations, Dr. Kemal Fahmy, Director of Excavations for the Western Delta, and Mr. M. Abd el-Fatah, Director of the Alexandria office of the E.A.O. We owe a great debt to our Egyptian colleagues in the field, Mr. Ahmed Mahmoud el-Nashar and

Mr. Osaama el-Sayed el-Katafany. We thank Dr. William Coulson, co-director of the Naukratis Archaeological Project, who kindly invited us to investigate Kom el-Hisn, which lies in the concession of the Naukratis Project. Dr. Richard Veredery, former director of ARCE-Cairo, and Dr. Robert Betts, current director of ARCE-Cairo, were both extremely helpful in arranging our fieldwork. We greatly appreciate the efforts of our colleagues in the 1986 field season, Dr. Douglas Brewer, Paul Buck, Dr. Maria Casini, Cathy D'Andrea, Dr. Donald Grayson, Dr. Hany Hamroosh, Dr. Bahay Issawi, Melinda Hartwig, Maureen King, Dr. Michał Kobusiewicz, Jo Kris, Karla Kroeper, Dr. Lech Krzyżaniak, Janet Long, and Emmy Zartman. The 1986 season was funded by National Science Foundation Grant BNS-8519637, and we thank Dr. Paul Walker, Executive Director of ARCE for administering this grant.

Robert J. Wenke and Richard W. Redding

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\* Please note that in our report of the 1984 season (Wenke and Redding 1985) the list of fish should have read: "...the schall (Synodontis schall), Tilapia nilotica, the Nile perch (Lates niloticus)...", and also that the list of mammals should have read "...the bubal hartebeest (Alcelphus buselaphus), a small equid (Equus sp.), the addax (addax nasomaculatus), ...".





The following report is from Ms. Noel L. Sweitzer, President of the Southern California Chapter of ARCE. Included in her summary of the Chapter's activities are sample Newsletters and schedules of lecture series on ancient Egypt.

Ms. Sweitzer has asked us to notify the ARCE membership that their group would like to hear any speakers who happen to come to Los Angeles. The Chapter can pay \$100 per lecture (about one and a half hours). If you are interested in giving a talk please contact

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# AMERICAN RESEARCH CENTER IN EGYPT

Southern California Chapter  
March, 1986

The purpose of this report is to summarize the major activities of the American Research Center in Egypt/Southern California Chapter (ARCE/SC).

ARCE/SC was preceded by first an informal group gathering of students and friends of Dr. John Callender, and then a more formal set of meetings of an entity designated Egyptian Archeology Council. By winter, 1984 the Egyptian Archeology Council had a mailing list of about 70 persons.

In January, 1985 Dr. W. Benson Harer, a Board of Directors member of the American Research Center in Egypt learned of the Los Angeles based group and proposed that it become associated with ARCE. Through his diligent efforts Dr. Harer was able to present and have approved the designation of the group as American Research Center in Egypt/Southern California Chapter. The advisory board of ARCE/SC was and remains Dr. John Callender, Dr. W. Benson Harer and Ms. Noel Sweitzer. The date of the formal designation was March, 1985.

The purpose of the group was to sponsor a speaker once a month and raise sufficient contributions at each meeting to pay that speaker, \$100. Meetings have been held at U.C.L.A through the scheduling ability of Dr. Callender. Each meeting has an attendance that ranges between 20 and 50 persons. The entry charge is \$5.00 with the exception that students are charged only \$3.00. Those to whom any fee is a burden are encouraged to come and contribute their enthusiasm rather than dollars. ARCE/SC members bring cookies, potato chips, soft drinks, cheese, crackers and whatever else they wish to share with the speaker and attendees at each session. The snacks are included in the price of admission. A list of speakers with topics and dates is attached.

In addition to the speakers, one of the ARCE/SC members donated \$900 to the club for a course of instruction in beginning hieroglyphs. This class was open to all people attending the ARCE/SC monthly lectures. A U.C.L.A graduate student in Egyptology was the recipient of that donation and he conducted a series of seven lectures in the home of one of the members.

Other members of the group were able to provide parttime employment to students of Egyptology, possible opportunities for further work on special Egyptology field assignments



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and just generally increase the awareness and support for the discipline.

While the majority of the 200 or so people on ARCE/SC's mailing list are not paid members of the national organization, they randomly attend the monthly activities. But, as a matter of fact, when the ARCE southern California regional mailing list was sent for incorporation into the existing mailing list of the newly created ARCE/SC there were only about 50 ARCE members in the area. Now, one year later with the designation of ARCE/SC that mailing list has increased by 26 new members specifically from ARCE/SC. An increase of fifty per cent (50%)!

One activity that stands out among the events over the last year is a trip members of the southern California chapter made to Egypt. Seventeen of the ARCE/SC, including Dr. John Callender and Noel Sweitzer the organizers, visited three active digs and many out of the way sites not on the standard tour. Dr. William Murnane was gracious enough to spend a day and a half lecturing on sites on Luxor's west bank, ie. Medinat Habu, Malkata, and Deir el Medina. A special treat was Dr. Murnane's tour through the Tutmosis III temple in the Medinat Habu enclosure. Later that afternoon, the members visited Chicago House and bought out the place by draining its stock of tee shirts, books and caps. Altogether the group spent about \$400 at Chicago House.

Over the year between contributions at the monthly events and reimbursement of the membership fee from ARCE, ARCE/SC took in around \$3,000. The single most notable expenditure was the \$900 paid for the hieroglyphs course. This was followed by \$1,500 being sent out to the monthly speakers. Of the \$1,500, \$100 was spent in supporting a joint lecture with the Friends of Archeology, another Los Angeles based organization that asked Dr. Peter Shinnie to speak at an evening meeting held at U.C.L.A. The remainder of expenditures were incurred in preparing and mailing out ARCE/SC's newsletter which is distributed about every two months to inform the recipients of upcoming activities. Approximately \$600 remains in the ARCE/SC bank account.

As part of his constant work to provide information and increase understanding of Egyptology, Dr. John Callender arranged for the U.C.L.A. extension to include a Saturday all day session on Ancient Egyptian Amulets and Love Charms. Robert Ritner was brought from the Oriental

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Institute to spend the majority of the day lecturing on the main topic. Dr. Callender talked for about two-fifths of the day on Egyptian writing and its origins as well as the sexual mores and practices of the Ancient Egyptians.

The extension monitors that sit in each extension class to evaluate interest and performance commented that the more than two hundred attendees were riveted to their seats and fascinated throughout the long day, ie. 9:00 a.m. to 4:30 p.m. To perpetuate that interest, Dr. Callender has obtained the commitment of U.C.L.A.'s extension department to sponsor a fall program with, again Robert Ritner and Dr. William Murnane. The subject will be Nefertiti and Cleopatra.

The ARCE/SC members had good representation in the audience and Dr. Callender announced the existence of ARCE/SC and from that announcement 40 of the people turned in their names and addresses for inclusion on the ARCE/SC mailing list. A followup letter was sent the next week which included a copy of the ARCE/SC most recent newsletter, an ARCE/SC membership application and an invitation to come to the next ARCE/SC lecture. Moreover, that list of 40 people was sent to Robert Ritner at the Oriental Institute to permit that entity to solicit contributions and memberships from the extension participants.

The sense of the above is that ARCE/SC and its members try to make opportunities for expanding awareness of Egyptology, they try to supply a varied program of activities and they try to help increase the enthusiasm for the entire subject. The result, hopefully, will be a stronger field of support for the discipline of Egyptology. So far, the readings that are available from those that have been brought together by ARCE/SC and its predecessor entities, are positive. More time, attention and money have gone into the activities associated with Egyptology in Southern California than before; specialists in the area or passing through the area are provided with a forum for lectures and individuals that were formerly limited in their opportunities to discuss issues related to Egyptology, now have an organization where they can talk about the projects that interest them and learn more of the multiplicity of its aspects.



SPEAKERS SPONSORED

EGYPTIAN ARCHEOLOGY COUNCIL

- J. Callender, The Festival of Sokar Osiris  
J. Callender, The History of Writing  
C. Raye, Egyptian Religion and Ma'at  
J. Van Lepp, Ancient Egyptian Dance Scenes

ARCE/SC

- J. Callender, 3/21/85, Curiosities of the Cairo Museum  
E. Meltzer, 4/24/85, The Egyptian Temple-Model of the Cosmos  
J. Johnson, 4/29/85, Work of the Oriental Institute  
R. Friedman, 5/85, Hierakonpolis  
W. B. Harer, 6/85, Egyptian Medicine  
N. Thomas, 7/85, Saite Tombs at Thebes  
A. Jennings, 8/85, A Nubian Village  
M. Lehner, 10/10/85, The Sphinx Project  
P. Shinnie, 10/17/85, Work at Meroe  
C. Keller, 11/85, The Palace of Amenhotep III at Malkata  
S. Hafez, 12/86, Intellectuals and the Government in Modern Egypt  
J. Callender, N. Gurba, C. Raye, J. Van Lepp, 1/86, Report on the  
International Conference of Egyptology at Munich  
D. Chapell, 2/11/86, Views of a Visitor to the Berkeley Theban  
Mapping Project  
R. Ritner, 2/28/86, Ancient Amulets and Love Charms  
J. Paulson, 3/86, Surveying in the Valley of the Kings-Berkeley  
Theban Mapping Project, a Team Member Reports

UPCOMING

- E. Taylor, 5/1/86, Advances in Radiocarbon Dating and Their  
Relevance to Egyptology  
Wm. Murnane, 5/13/86, The Amarna Boundary Stela Project

ARCE/SC APRIL NEWSLETTER

\*Annual Report\*

A good many activities have taken place over the last year. To summarize them, an annual report, our first, has been prepared. Since you were involved in some or all of the events, a copy is included for your information.

\*Speakers\*

On May 1 at 7:00 p.m. Dr. Erwin Taylor will speak on Radiocarbon Dating Advances and Their Relevance to Egyptology. The meeting will be held in Haines Hall, Room 329. Refreshments will be provided as usual for this and the other talks.

On May 13 at 7:00 p.m. DR. WILLIAM MURNANE, of Chicago House in Luxor, has agreed to speak to ARCE/SC. Dr. Murnane has worked in Egypt for over 15 years. He spends the seasons on the staff of the Epigraphic Survey conducting important work on various projects for Chicago House. One of his latest projects concerns the Amarna Boundary Stelas. Dr. Murnane will speak on this and other topics the evening of Tuesday, May 13. That meeting will be held in Math Sciences Building, Room 5128. Dr. Murnane will just have returned from this season's work, so try not to miss his talk.

On June 17 at 7:00 p.m. Norma Gurba will speak to ARCE/SC on the subject of MUMMIFICATION. Ms. Gurba is completing work on her doctorate at UCLA and among other things, has concentrated on the mummification process. During her studies, Ms. Gurba spent time in Egypt to secure first hand data on many of the areas of interest to which she was dedicating her efforts. The Tuesday, June 17 talk by Ms. Gurba will be held in Haines Hall Room 329.

The contribution requested for each of the talks is \$5.00. As you know, this helps ARCE/SC pay \$100 to the guest lecturer and cover the costs of the mailing. The refreshments are provided free by ARCE/SC members.

\*Egypt Trip\*

Dr. John Callender and Noel Sweitzer have again organized a trip to Egypt January 16, 1986 and February 7, 1986. This trip will cover many places that were not visited last year.

\*Dues\*

Both ARCE and ARCE/SC are supported mainly by dues. While the club meetings carry themselves for the local speakers, it is not possible to have people from out of town unless ARCE/SC can help pay their way. Membership in ARCE on a national scale constitutes membership in ARCE/SC. There are approximately 200 people on the ARCE/SC mailing list. 26 of these are ARCE/SC members. If you think that ARCE/SC is worthwhile to your interest, then please take time to fill out the attached membership application and send in your membership dues. The membership year will be the same as ARCE's, that is from July 1 to June 30. Even if you have just paid for next year's membership, will you please let us know through indicating your membership status on the form and returning it. If you do not have enough extra money to continue inclusion on the mailing list for \$10 per year, just drop a line and we will still include you. For more information call Noel Sweitzer 213-739-1089. Hope you will help support the club.



The main purpose of this newsletter is to let you know of the upcoming speakers. The programs are really taking shape for the next five months. Not all the dates have been tied down, but as three or so are scheduled, the times and locations will be noticed to the membership.

JUNE 17, 1986

TUESDAY, 7:00 p.m. - HAINES HALL ROOM 329---NORMA GURBA will speak on MUMMIFICATION. This is a topic that has a wide appeal. You might consider inviting friends who do not wish to know about Egyptology in great detail, but would be interested in "mummies".

JULY 17, 1986

THURSDAY, 7:00 p.m. - LIFE SCIENCES ROOM 2142--(This is a new building for ARCE/SC. It is near the hospital complex behing the Math Sciences' building section. Call the UCLA information number if you are unfamiliar with the campus.)-DR. W. BENSON HARER will speak on THE LOTUS-A REVISION OF THE TRADITIONAL EGYPTOLOGIST VIEWPOINT. Dr. Harer has given this lecture to a number of audiences. It provides the listener with a new concept of the flower and its interpretations. He suggests a mystery that you will want to uncover.

AUGUST 25, 1986

MONDAY, 7:00 p.m. - HAINES HALL ROOM 329---ROXIE WALKER, a paleo-anthropologist, Ms. Walker will relate her discipline with that of Egyptology. She was on Geoffrey Martin's expedition when he discovered MAYA's TOMB. While she cannot divulge any secrets, Ms. Walker has agreed to mention that discovery. ARCE/SC will get more information on MAYA than provided in the newspapers.

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SEPTEMBER - Zahi Hawass, the Director of Inspection for the Giza Plateau will visit Los Angeles and speak to ARCE/SC  
OCTOBER - Dr. Richard Fazinni of the Brooklyn Museum will be out sometime this month and talk to a specially convened ARCE/SC meeting.

HANY TAKLA, one of the ARCE/SC chapter members will talk to the group of COPTIC CHURCHES - ART AND ARCH-ITECTURE.

NOVEMBER - DORTHEA COLE will speak to ARCE/SC on THE PEOPLE OF THE TOMBS or WOMEN IN GYNECOLOGY.

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All lectures require a \$5.00 fee so that ARCE/SC can offer a stipend to the lecturers.  
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Dr. John Callender is leaving for Egypt at the end of July for a two year term as visiting professor, American University, Cairo. He will be missed. John has seen to it that a suitable replacement will fill his slot for the next two years. The second year, Dr. William Murnane will be taking over John's teaching assignments.

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Do not forget to get your membership in. If anyone wishes to help update the ARCE/SC mailing list, please call Noel Sweitzer for details. (213-739-1089)

\*MEMBERSHIP\*

For the last few months you have been solicited by this local chapter and the national ARCE for membership. A \$35.00 annual membership in one of the organizations constitutes membership in the other. The problem when the membership is sent directly to New York is that the local chapter does not get a notice of it. If you send it through Los Angeles, then that chapter knows you are current and want to stay on the mailing list.

please if you choose to be removed from the mailing list drop a note or card to:

Noel Sweitzer  
1229 S. Westmoreland Ave.  
Los Angeles, CA 90006  
213-739-1089

\*LECTURES\*

This summer and fall offer an extraordinary opportunity to hear dynamic, renown Egyptologists. The entrance fee per lecture remains \$5.00. While the Club tries to get the same room in Haines for each lecture that is not always possible. In fact, sometimes UCLA makes last minute changes which can only be noted by a sign on the door of the room that was scheduled. Please be patient in case that situation arises.

AUGUST 25, 1986

MONDAY - 7:00 p.m. - HAINES HALL ROOM 329---ROXIE WALKER---Modern technology has been used to extensively analyze a few Ancient Egyptian mummies in various museum collections and give detailed data on diseases, embalming practices and so forth. However, since most excavators are trained in either art history or philology, the vast majority of excavated human material is usually given only a cursory examination for the estimation of sex and age at death.

The team that excavated the Nineteenth Dynasty Tomb of Iurudef at Sakkara in 1985 has changed all that.

The human material excavated from this site has been researched in depth and yielded a substantial data base on the population biology of the inhabitants of Ancient Men-Nefer (Memphis), as well as individual histories of some of these people, insights into their work, burial practices and family relationships. The work continues with both this collection and 150 additional burials excavated at Sakkara in the 1986 Season.

Preliminary results of this research have led to the formation of a physical Anthropology Research Center at Giza and a companion conservation and research center at Sakkara.

Come to this lecture in August and experience the joy and heartbreak of the Iurudef excavation, the actual skeletal studies being done and the final detective work leading to the reconstruction of an Ancient society with ROXIE WALKER, the independent anthropologist that was on the dig and who is making it all happen. ROXIE was present when the excavation's leader, GEOFFREY MARTIN, discovered Maya's Tomb about 60 feet from where ROXIE was working.



MONDAY - 7:00 p.m. - HAINES HALL ROOM 329---ZAHl HAWASS---ARCE/SC is privileged to have one of the most distinguished members of the Egyptian Department of Antiquities as its lecturer on this date. Mr. Hawass is currently finishing his studies at the University of Pennsylvania in accordance with the University's doctoral program for Egyptologists. He is on leave from the Department of Antiquities where he has served as the Director of Inspections for the Giza Plateau.

Mr. HAWASS has made numbers of notable discoveries during his work on the Pyramid complex. For ARCE/SC he will discuss both his past adventures at the Pyramids and the Sphinx and what direction his future field work will take in that same area. ZAHl HAWASS will again bring to this chapter the opportunity to hear some of the problems and thrills of being a field Egyptologist.

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OCTOBER 16, 1986

THURSDAY - 7:00 p.m. - KINSEY HALL ROOM 230---HANI TAKLA---You may be aware that the City of Los Angeles has a strong Coptic community. One of the most prominent members of that community is also a member of ARCE/SC. HANI TAKLA has agreed to address the membership on some of the historical work he has been conducting on ancient Coptic monuments.

Mr. TAKLA is also involved in preserving a record of Coptic heritage through the understanding and compiling of data of Coptic art and architecture.

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OCTOBER 21, 1986

TUESDAY - 7:00 p.m. - ROOM ASSIGNMENT IN PROCESS---RICHARD FAZZINI---Dr. Fazzini is the well known curator of the Department of Ancient Egypt at the BROOKLYN MUSEUM. He is also the Museum's Director of the MUT TEMPLE expedition.

At the invitation of one of our members, Dr. Fazzini has agreed to speak on the MUT TEMPLE expedition. He has been working on the site for many seasons and will provide a unique and memorable address on the subject.

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NOVEMBER 18, 1986

TUESDAY - 7:00 p.m. - ROOM ASSIGNMENT IN PROCESS---DORTHEA COLE---Those ARCE/SC members who had the opportunity to attend the Annual ARCE meeting in Washington, D.C. this Spring will remember Ms. Cole. She is an excellent speaker who talked about "Women and Gynecology in Ancient Egypt".

On this occasion Ms. Cole's lecture will be "The People of the Tombs". This includes funerary practices, building of tombs, involvement of people in their beliefs of the afterworld and its impact on their lives. The topic also includes a description of the daily life of the people, as pertaining to their preparation for the after life. The presentation will include slides portraying material from the tombs tomb paintings, and funerary material, emphasizing the activities of women in their daily lives and their position in the afterworld.

COME TO ALL THE ABOVE AND JOIN WITH OTHERS WHO LOVE  
\*\*\*\*\*EGYPT\*\*\*\*\*

Adult Lecture Series On Ancient Egypt

Monday Night between 7:00 p.m. and 9:00 p.m.

October 27, 1986 - January 5, 1987. 20 person class limit to be held at  
10535 Wilshire Blvd. - Noel Sweitzer.

The purpose of the series of lectures is to permit each participant a broader understanding of some of the basic features of Ancient Egyptian civilization. Dr. Antonio Loprieno, Visiting Professor of Egyptology at U.C.L.A., will discuss:

- (1) Egyptian Religion as it pertains to
  - (A) the King
  - (B) the Tomb
  - (C) the Temple
- (2) The cultural image of Ancient Egypt as portrayed by the judaeo-christian religious tradition
  - (A) Biblical History
  - (B) Islam
- (3) Ancient Egyptian language and writing; its evolution and features as portrayed through
  - (A) Historical survey
  - (B) Hieroglyphic writing system
  - (C) the structure of the Egyptian language

The lectures will be held by Dr. Antonio Loprieno, who replaces Dr. John Callender at U.C.L.A. during the present academic year. He is Professor of Egyptology in the University of Perugia, Italy and in the University of Göttingen, Federal Republic of Germany. His main research and publication topics are Egyptian Grammar, Egyptian Religion, and the comparative study of Egyptian language and civilization within the Ancient Near East.

For further information call Noel Sweitzer, (213) 739-1089 or Dr. Loprieno, (213) 206-1396 at U.C.L.A.

COST - \$100



ARCE/SC

American Research Center in Egypt/Southern California Branch  
Newsletter February 1986

We regret the delay in the appearance of this newsletter, but we hope that you will enjoy the following programs (all at UCLA):

Robert Ritner, doctoral candidate, University of Chicago

**Egyptian Love Charms**

Friday, February 28 at 7:00 P.M. in Kinsey 382. (building near flagpole)

Joel Proulx, member of the Theban Mapping Project

**The Theban Mapping Project**

Thursday, March 20 at 7:00 P.M. in Royce Hall 164.

Ervin Taylor, UC Riverside

**Recent Advances in Radiocarbon Dating and Egyptian Chronology**

Thursday, May 1 at 7:00 in Haines Hall 329.

As we have been doing, we request a \$5.00 donation to help us defray the costs of speakers and postage.

**Trip to Egypt: 1987**

J. Callender and Noel Sweitzer are organizing a trip to Egypt for January and February (Jan. 16-Feb.6) a year from now. The trip will include the special features of a trip to Khargeh oasis, and a Nile cruise from Luxor to Aswan. For information contact either person: J. Callender, (818) 780-4191, or Noel Sweitzer (213) 739-1089 (work)/ 474-5455.

THE GIZA PLATEAU MAPPING PROJECT: SEASON 1986

INTRODUCTION

The second season of the Giza Plateau Mapping Project began on February 1 and ended March 27, 1986. The team consisted of Mark Lehner (A.R.C.E.), Field Director; David Goodman (California Department of Transportation - CALTRANS), Chief Surveyor; and Christiane Zivie (C.N.R.S.), Egyptologist. We were fortunate again this season to have the collaboration and assistance of Ms. Amal Samuel, Inspector for the Egyptian Antiquities Organization (1).

The objectives of the second season were 1. to complete and check the ground survey measurements of the control traverse which was established over the Giza Plateau during the first season (Goodman in Lehner 1985a; Goodman and Lehner 1986); and, 2. to continue clearing and mapping the features of the Khafre Pyramid court. The program accomplished the following:

1. All ground survey of the control network was completed with all the main, supplemental, and auxiliary traverse stations measured. The GPMP survey network was "tied" to an official Survey of Egypt triangulation station monumented by a copper plug at the top of the Great Pyramid.

2. The mapping of the features cut in the rock floor around the base of the Khafre Pyramid was continued. This season we began to clear the debris from the SW corner of the pyramid. Here we documented for the first time a rock-cut trench located off the diagonal of the pyramid and cut through the bed of the enclosure wall. There are similar trenches at the other three corners of the pyramid (Lehner 1983, 9-11). The clearing also revealed undisturbed ancient stratified deposits which were documented but left unexcavated.

1. CONTROL NETWORK

During the second season of the GPMP, a Wild T2 one-second theodolite and an engineer's precise pendulum level were loaned to the project by CALTRANS. In addition, CALTRANS generously donated a Lietz Red 2A infrared electronic distance measurer (EDM), along with a set of reflectors, for use by the GPMP and other ARCE-expedited projects.

With this second order equipment, points of the main traverse were remeasured and checked. The measurements of all supplemental and auxiliary stations were completed. Many of these are positioned around the major quarries to the S of the pyramids (Lehner 1985, 49, Fig. 5). They will be useful in



calculating the volumes of stone which have been extracted. One of the two official Survey of Egypt markers at the top of the Khufu Pyramid was "tied" into the GPMP survey network. This first-order monument is a copper geodetic marker fixed with mortar in the SW corner of the square forming the top of the pyramid, 2.3 m SW of the prominent wooden pole marking the center of the top platform. The pole is the other, second-order, survey monument. This is said to have been replaced, and the replacement moved and reset, since the monument was first established. Therefore, we did not measure its position with respect to our traverse. The geographic coordinates of the first-order monument are: latitude 29 58'44.38"; longitude 31 07' 57.02" (elevation 197.24 m). A reflector was set on the copper marker and its position was measured from station GP8 to the W of the pyramid, and from GP1 on the prominent knoll to the S of the Sphinx (see Lehner 1985, 49, Fig. 3).

## 2. KHAFRE PYRAMID SURVEY

During the 1984-85 season, points were set at each of the four corners of the Khafre Pyramid court. These marked the intersections of lines of small rock-cut holes which occur at regular intervals along the outside of the bed of the pyramid enclosure wall on the N, S, and W sides, and in the court parallel to the inside of the enclosure wall bed on the E side of the pyramid. The points of intersection were established by first marking the bisection of the end holes on each line. The lines obtained were taken as best approximating the centers of all rock-cut holes on each side. Each of the established lines was extended outward at each end to an intersection with the lines of the two adjacent sides of the pyramid court. The four points were designated, NE corner: GII3; SE corner: GII4; SW corner: GII5; NW corner: GII6.

The idea was to test the hypothesis that the holes were cut for stakes which carried an accurate reference line for the levelling, orientation and alignment of the pyramid base during its construction (Lehner 1983). If the holes indicate a builder's reference line, they should be proved straight for the length of the pyramid court. The straightness, orientation, and interior corner angles of the hole-lines should allow for an accuracy equal to that of the pyramid base.

As described earlier (Ibid., Id. 1985, 32-38), there are actually three linear series of holes on each side of the pyramid. Two lines occur along the outside, and one line occurs along the inside, of the enclosure wall bed on the N, S, and W sides of the pyramid. On the E side, two lines occur inside the court, 9.1 and 9.9 m from the pyramid base, and a single less consistent series runs along the outside of the enclosure wall bed. The series immediately along the outside edge of the enclosure wall bed was selected for survey on the N, S, and W sides, while the

line 9.9 m from the pyramid base was chosen for survey on the E side. These lines were chosen from the three series on each side on the basis of their apparent consistency of spacing and straightness.

In the last progress report it was shown how the hole-lines on the N and W intersect in a corner hole, "NW", which was cleared and mapped last season (Ibid., 53-54, Figs. 9-10). No holes or markers were found at the intersections of the hole-lines on the N and S with that selected on the E.

The SW corner of the court was covered with debris which slopes up to a thickness of 1.7 m at the outer corner of the enclosure wall bed. Prior to our project, a trench had been excavated into the mound from the E to the approximate outer corner of the enclosure wall bed. This had become refilled with loose sand and debris. Our point at the SW corner (GII5) was set by clearing out a small patch of rock floor from the debris at the deep end of the trench. We had to plumb the intersection of the W and S hole lines down into this small clearing. The interior angle of this corner was the most off 90 degrees (90 03'41") of the four angles we established by the series of hole-lines. This season we were allowed to completely clear out the old excavation trench and to begin clearing the general SW corner of the Khafre Pyramid court (see Fig. 1 and below). We were thus able to reset the SW corner point by again extrapolating the lines of the W- and S- series of holes. Our newly set point GII5 fell 7 mm S of the point set last year. With the old excavation trench cleared out and trimmed back it was seen that the SW intersection of the hole-lines we selected falls, like that at the NW corner, in a crudely fashioned shallow hole (designated "SW" - see Fig. 1) at the point of the outer corner of the enclosure wall bed.

With the SW corner point reset, it was required to remeasure the interior angles at the NW, SE, and SW corners formed by the hole-lines we selected. The NE angle was also rechecked. Thus, the results given in the last report (Ibid., 37) are amended as follows:

Side	Line	Distance	Azimuth	Deviation
N	GII6-GII3	238.738	89° 55'27"	-4'33"
S	GII4-GII5	238.671	89° 56'28"	-3'32"
E	GII3-GII4	243.009	359° 54'42"	-5'18"
W	GII5-GII6	242.864	359° 53'43"	-6'17"
Average				4'55"



Corner	Angle	Deviation
NE GII4-3-6	90° 00'47"	+0'47"
SE GII3-4-5	89° 58'13"	-1'47"
SW GII4-5-6	90° 02'44"	+2'44"
NW GII5-6-3	89° 58'14"	-1'39"

Again, for comparison, the corner angles and azimuths of the sides of the Khafre Pyramid, on the basis of the survey by J. Dorner (1981), are as follows:

Side	Azimuth	Deviation
N	89° 54'50"	-5'10"
S	89° 54'20"	-5'40"
E	359° 54'00"	-6'00"
W	359° 54'00"	-5'43"
Average		-5'43"

Corner	Angle	Deviation
NE	90° 00'50"	+0'50"
SE	89° 59'40"	-0'20"
SW	90° 00'20"	+0'20"
NW	89° 59'40"	-0'20"

With the exception of the NE corner, the interior angles of the pyramid base, as determined by J. Dorner, are better than those of the hole-lines, as we established them, by one to two minutes of arc over a distance of about 215 m for the pyramid and 239 to 243 m for the hole-lines. However, based on this data, the hole-lines, except for that on the W, are better oriented to the cardinal directions than the sides of the pyramid.

### 3. KHAFRE PYRAMID COURT CLEARING AND DETAILED MAPPING

Light (except for the maneuvering large granite casing fragments) surface cleaning continued at the NW corner of the Khafre Pyramid court this season. The detailed mapping was continued to the N from the area mapped in 1984-85 (Lehner 1985, 53, Fig. 9).

Most of the work at the Khafre Pyramid this season was focused in the SW corner which was covered with debris of sand and limestone chips that had never been entirely cleared. The debris ranged in depth from zero to a few centimeters, at the corner of the pyramid core, to 1.7 m in a mound covering the outer corner of the enclosure wall bed (Fig. 1). This mound banks up against the high bedrock ledge which runs parallel to the W side of the pyramid about 13.75 m from the outer edge of the enclosure wall bed. The thicker deposit stretches off to the S-SE and marks the route of a dumping track used during previous clearing along the

W side of the Khafre Pyramid in the 1960's. The bed of another dumping track, consisting of debris .28 to .40 m thick, runs through the center of the court in front of the SW corner of the pyramid and out to the SE. A series of "Sound and Light" electrical cables runs across the corner of the court and along the N base of the mound of debris to terminate in a rock-cut tomb, sealed by an iron door, in the high ledge to the W. The debris sloped down to a shallow depression at the center of the court, following the dip of the rock floor underneath. It was expected that a rock-cut trench would be found under the debris at this point, since such trenches occur at the other three corners of the pyramid (Lehner 1983, 9-11). Several worn pavement slabs were visible along the E side of this depression. A large patch of in situ pavement was also exposed immediately to the N of the depression.

The clearing of this corner of the Khafre Pyramid court was not completed this season (Fig. 1). We tried to follow the outlines of the previous excavation in case any undisturbed stratification remained. The areas which we cleared had been excavated previously and the debris was redeposited, presumably since the 1960's, as evidenced by inclusions of modern glass fragments, foil, chaff, and paper. (Maragioglio and Rinaldi 1966, 98 mention that as of January 1966 the clearing on the W side of the Khafre Pyramid was "on its way to being completed.") We cleared out all the loose debris from the old excavation trench along the far W end, S side, of the enclosure wall bed. We also trimmed back and squared off the sides of the trench which was designated Removal 1 (R1, see Fig. 1). This exposed a stratified deposit, the lower layers of which were laid down before the modern clearing of this area. None of these layers, which extended across the bed of the pyramid enclosure wall, were excavated during our season beyond trimming back the sides of the trench. However, the stratigraphic profiles thus exposed were drawn (Figs. 2, 3). A description and preliminary interpretation of these deposits follows.

#### 3.1. Stratified Sequence in the SW Corner of the Khafre Court.

See Figs. 2 and 3.

1a. Brown sand with some gypsum and many loose limestone fragments, .60 to .80 m thick at the W end of the trench, thinning out to the E and N on the slope of the mound. 1a slopes away from the face of the section we cut in the N and W balks.

1b. Soft greyish-white powdery sand/gypsum mixture with concentrated limestone chips and modern inclusions (straw, glass, paper). 1b is distinguished from 1a by a higher concentration of gypsum and limestone dust.

1c. Concentrated soft gypsum powder. A fragment of modern glass



was found at the bottom of 1c in the far N side of the W balk. 1c is lensed between 1b and 1d or 2.

1d. Fine soft brown sand with minute bits of limestone.

1e. Cut (excavation line) through 2-4a.

2. Compact clean brown sand with minute limestone bits, scattered small worn limestone fragments and a few modern inclusions. Drying lines, indicating short-term surfaces, run horizontally through this layer.

3. Soft clean sand with very large, fine, white (Turah-quality) limestone pieces (up to .35 X .80 m), and sharp-edged large limestone flakes throughout. This layer is up to .52 m thick in the W balk.

3a. Cut through layer 4a, filled with 3 (N balk, Fig. 2).

3b. Cut through layers 5-6, filled with 3 ("E balk," Fig. 3).

4a. Light colored sand mixed with gypsum and sharp-edged limestone chips. This layer is .20 to .36 m thick.

4b. Concentrated crushed gypsum and flakes, chips, and larger fragments of limestone. 4b is .15 m thick.

4c. Cut through layers 5-6 (N balk, Fig. 2).

5. Tan-colored sand and limestone gravel of chips (.01 to .10 mm) and small rounded limestone bits. The limestone chips are somewhat larger near the top of the layer which is from .04 to .25 m thick. At places it was difficult to distinguish between the bottom of 3 and the top of 5, but 5 is more gravelly and the limestone bits are notably worn. Small pieces of chert, sandstone or quartzite, and a few dolerite fragments were noted in 5. Small bits of alabaster are scattered throughout this layer. Very worn, small bits of pottery, mostly crude red ware, occurred in 5. Dry-lines and sand pockets run horizontally through this layer.

6. Dark grey alluvial dirt and gravelly sand mixture with the same consistency as 5. There is not a sharp demarcation between 5 and 6. Very worn, pottery fragments, mostly crude red ware, occur in 6. This deposit fills the pockets of the very rough floor along the outside of the enclosure wall bed and practically disappears at high places of the bumpy rock. 6 was filling half of the corner hole, "SW" (Fig. 1), and we cleared this out. Otherwise, 6 was left in the SW corner of the trench as we found it. 6 is .05 to .07 m at its thickest.

### Interpretation

Layers 1a through 1d have been laid down in very recent times as evidenced by modern inclusions of glass, paper, etc. Most probably these layers were deposited during the clearing of this side of the pyramid in the 1960's. The limestone dust and gypsum mixed with sand and limestone fragments must be from the enormous amounts of this debris left banked up against the face of the pyramid when its casing was robbed. The material was further mixed as it was carted away along the dumping track. The cut line, 1e, in the N balk and the top of layer 2 probably mark the limit of the recent clearing in the deposits at this corner of the pyramid.

Layer 2 results from drift and gradual accumulation of sand as indicated by the successive "drying lines" which run through the layer. These were once surfaces. During the time that 2 accumulated there was little activity at this site.

Layer 3 is left from a major period of robbing when much of the Turah-quality limestone of the pyramid casing and enclosure wall was removed, broken up, and taken away. Practically all the very large limestone pieces and flakes in this layer are of the fine white Turah-quality stone which was used for outer finish masonry. The sharp edges on the flakes and chips indicate that they were sealed in the deposit without being long exposed or turned over repeatedly. The loose clean sand is probably wind-blown, a deposit which existed when the limestone casing was robbed. At the same time, some of the large limestone pieces rest at the bottom of layer 3, and on top of layer 5. At the E end of the trench, there is a piece from the curved top of the enclosure wall (Figs. 1, 3). We were able to salvage some of the stratigraphic relations of this piece by cutting a staggered section along the block. This shows that the top piece of the enclosure wall came to rest at the bottom of layer 3 and nearly on top of layer 5. If layer 5 was deposited in the 4th Dynasty (see below), this indicates that there had been little deposition around the outside of the pyramid court before the robbing of the wall and casing. It is not known, however, how much might have been removed from layer 5 prior to the time that 3 was laid down. The scant stratification under the wall top piece (Fig. 3) shows a cut, 3a, through layer 5, indicating that some of 5 was removed prior to the deposit of 3. No pottery sherds or other material diagnostic of the period when 3 was deposited were found in the faces of the trench. (Petrie (1883, 98) found a coin of Sultan Hassan (1347-1361) in sand where a foundation stone had been removed at the SE corner of the pyramid.)

Layer 3a looks like an excavation cut through layer 4a. But it could only mark the line where the sand and debris of layer 3 came to rest against the rubble from the core of the enclosure wall at the time the wall was robbed and layer 3 created.



Layer 4a extends nearly across the width of the enclosure wall bed (Fig. 2). Because it is a sand/gypsum mixture with many sharp-edged limestone chips, it might have been left from the robbing of the enclosure wall. This is also indicated by the fact that layer 4a is not seen in the opposite S balk which is outside the court defined by the enclosure wall. The question is why the removal of the wall would have left this deposit spanning the width of the wall, unless the wall was constructed with a core of limestone/gypsum rubble cased with large Turah-quality slabs. When the outer casing was ripped away, it left the debris from the core.

Layer 4b may be only a pocket at the bottom of 4a with more concentrated gypsum and limestone chips. However, 4b occurs just at the raised outside edge of the enclosure wall bed. 4b also cuts through layers 5-6 along line 4c (Fig. 2). These facts suggest that 4b may be from the actual building and dressing of the enclosure wall. If so, the cut-line, 4c, may be a kind of foundation trench through layer 5 for placing the limestone slabs for the foundation of the wall.

Layer 5 is possibly debris left over from the time the Khafre Pyramid was under construction. The very worn, rounded character of both the limestone chips and the pottery in this deposit indicates that the material has been turned over repeatedly and under pressure. The fragments of chert, dolerite, and quartzite - materials from which tools were manufactured - also suggests 5 is construction debris. At the same time, "drying lines" run horizontally through 5. These are temporary surfaces which indicate that deposition of 5 was gradual and cumulative. Three diagnostic sherds were recovered from 5 during the balk trimming. Although their provenience is not completely reliable, they look to be of the Old Kingdom. Two were fragments of carenated bowls and one was from the rim of a crude red ware jar. It is significant that 5 occurs outside the bed of the enclosure wall and terminates at its outer edge, under 4b. One would expect that the enclosure wall and court pavement were the last elements built, after the pyramid was complete and its base cleared of debris. If 4c is a kind of foundation trench cut through 5, it indicates that construction debris about half a meter deep was left around the outside of the court when the wall was made. There is the strong possibility that 5 and 6 are the deposits left outside the pyramid court at the time the pyramid complex was finished and functioning - or what Reisner would call the 4th Dynasty "living floor." The character of the limestone gravel in 5 suggests that it was not produced from the dressing of the enclosure wall.

Layer 6, grey alluvial dirt with scattered sherds, looks to be better suited than 5 as a "living floor." One might expect such dirt to be on top of 5 - residual construction debris. Yet 6 is the first deposit over the worked natural rock floor outside the

corner of the enclosure wall. Could this alluvial mud, which was brought up to the far corner of the pyramid from the Nile Valley, be a residue of mud embankments for holding water as a reference for leveling the pyramid base? It should be pointed out that the scant remains of walls, forming a corner, which protrude from under the N edge of the mound of debris are also composed of alluvial mud and gypsum (see Fig. 1). Slightly farther W, out of the view in Fig. 1, a deteriorating wall is composed of alluvial mud and limestone rubble. It also protrudes from the N edge of the mound and extends 5.35 m to the N. These remains will be studied in future seasons. They possibly relate to the rock-cut tombs, which have not been completely excavated, in the high ledge 13.75 m from the W side of the pyramid court. Layers 5 and 6 in the trench, R1, may also relate to Old Kingdom activity later than the completion of the Khafre Pyramid court. However, this is not the case if 4b and 4c, which cut through 5, do relate to the founding of the enclosure wall.

### 3.2. The SW Corner of the Khafre Court: Notes and Observations on the Plan.

The SW corner of the Khafre Pyramid court has never been completely cleared, though most of the older deposits were turned over when the clearing took place along the W and S sides of the Pyramid in the 1960's. We did not finish clearing the corner this season. The extent of our clearing is indicated in Fig. 1. The following observations can be made on those parts so far cleared.

#### First Course - Core Massif

As at the NW corner of the pyramid, the natural bedrock is exposed in the core at the SW corner, having been cut back in steps for the first four courses. The natural rock massif can be seen along the entire W side of the pyramid. It was left for the core construction when the original rock surface was cut down for the pyramid base, court, and lower terrace outside the enclosure wall (Petrie 1883, 98; Maragioglio and Rinaldi 1966, 44-6). The original level of the natural rock on the W is traced by the top of the high ledge which runs parallel to the pyramid.

Maragioglio and Rinaldi (Ibid., 100) noted that the top of the first course of the pyramid, as indicated by the first step of the core, was remarkably well levelled. This and the enclosure wall bed are the most level surfaces around the base of the Khafre Pyramid. The bed or socle for the lowest casing course of granite consists of emplacements, cut at various levels, for the individual blocks. Four spot-heights taken on the bedrock step of the first course at both the NW and SW corners show an average difference in level between the two corners of 3 cm. We have yet to run levels along the sides of the pyramid.



The exact corner of the first step has been weathered into a slope. At the corner there is a subsidiary step cut into the natural rock, .83 m lower than the top of the first course. This step is .70 m wide on the S side and .56 to .65 m wide on the W side. It extends along the S side of the core for 3.72 m at which point it meets in situ backing blocks and gypsum which filled the space between the granite casing and the bedrock core. A similar subsidiary step is cut from natural rock at the NW corner (Lehner 1985, 40 and Figs. 9, 10). The subsidiary step drops .40 to .44 m to the rock socle with its emplacements for the individual granite casing blocks.

#### Casing Socle

At the corner, the casing socle is wider on the W side, at 2.52 m, than on the S side where it is 2.20 m and narrows to 1.98 m 5 or 6 m farther E. As at the NW corner, the emplacement for the corner casing stone indicates an enormous sized block. The emplacement is 2.20 m (E-W) X about 4.50 m (N-S) - the same size as that at the NW corner. However, contrary to the NW corner, the emplacement for the SW corner block is raised about the adjacent natural rock floor of the court by .123 to .224 m. The extreme outside corner of the emplacement is slightly broken along a small fissure, but at the tip of the corner there is a small hole, about 5 cm in diameter. There is a socket, presumably for a lever, .45 m wide, cut at the N end of the corner emplacement. This was filled with granite dust and gypsum. Traces of two lever sockets are on the W, outside, edge of the emplacement. That on the N is only .23 m wide and .30 m long, while the one to the S is .32 m wide and very shallow. Another small (.23 X .27) lever socket is cut on the E edge of the emplacement (see Petrie 1883, 98).

The emplacement for the first granite casing block after the corner on the S side also indicates a large block, at 3.65 m (E-W) X 1.98 m (N-S). This has four lever sockets at the outside edges. There is also a wedge-shaped cutting across the S edge of the socle which has been tightly fitted with a stone. This may be a lever socket, but it does line up with the W side of the pyramid core. Further E along the S side the emplacements for the casing blocks are thinner. They are partially covered by thin layers of pinkish gypsum mortar left after the granite blocks were removed.

#### Granite Casing Blocks

8.66 m E of the socle corner there is a granite casing block which is nearly in situ, but twisted slightly toward the W. This, and the other granite casing block, in situ and 2.83 m to the E, were noted by Petrie (1883, 31). The first block measures 1 m (E-W) X 2.38 m (N-S). The W half of its top and inclined face have been broken away. The back of the block has been pryed

slightly away from the pyramid core. The natural rock of the core was cut to fit the back of the casing block. To the W and E of this block, a backing of limestone blocks and mortar remain on the core, indicating that the granite blocks were not always fitted so closely against the core (see Maragioglio and Rinaldi 1966, 48-50, Tv. 6, Fig. 4).

The other preserved granite block on the S side, 12.50 E of the SW corner of the socle, is one of only five granite casing blocks remaining in situ around the entire base of the Khafre Pyramid. Notches were cut down the center of the block for splitting it during a period of robbing, but the block was never split or moved. The block is 1.94 m long. As indicated by the spot heights in Fig. 1, the top of the block is very well levelled with respect to the Turah-quality limestone backing block behind it, the gypsum fill, and the top of the first course or step cut from natural rock.

Both of these granite casing blocks have a vertical cut, or foot, at the front base. The top of the foot is where the limestone pavement of the court met the face of the pyramid, thus forming the pyramid baseline (Petrie 1883, 30, 96, Pl. XII; Maragioglio and Rinaldi 1966, 48, Tv. 6, Figs. 2, 6, 7, 9). The top of the casing foot is .02 m higher on the in situ block than on the block which has been slightly shifted. The pavement along the S side of the pyramid baseline at this corner is mostly broken away from the casing socle, but a single pavement slab is preserved which meets the foot of the in situ granite casing block, thus preserving a small part of the original pyramid baseline (Fig. 1). Otherwise the pavement is very worn and broken along hairline fissures which seem characteristic of much of the Turah-quality limestone used for finishing parts of the Khafre complex. The surface of the pavement also weathers into a fine white limestone dust similar to chalk.

A lever socket under the foot of the granite block which has been slightly moved is likely original to the construction of the pyramid. Like the two lever sockets, one for each emplacement, to the W of the block, this socket is only .20 to .22 m wide, indicating the use of a smaller lever than those used for the much larger blocks at the very corner (cf. Petrie 1883, 98).

#### Court

There are no carefully cut round holes just outside the SW corner of the socle like those at the NW corner (Lehner 1985, 40-1, 53-4, Figs. 9-10). Instead, there is a prominent rectangular cutting like those for individual pavement slabs on the rock bed of the court. The cutting at the pyramid corner is unusually deep and prominent. It extends from 2.55 m N of the SW corner of the socle to 1.30 m S beyond the corner. The cutting turns to the E to extend 1.22 m along the S side of the socle. It ranges



from .12 to .07 m deep with respect to the bedrock floor of the court, or .22 m deep with respect to the raised socle. There are small squarish holes along the edges of this cutting. They range from .22 to .25 m in width. There is one pair of these holes on the N edge and two pairs on the S edge of the cutting. These appear to be lever sockets like those on the edges of the emplacements for the granite casing blocks. The S-most pair of holes along the W edge line up with the S side of the pyramid baseline which, if extended, splits the space between the holes (Fig. 1). These may have functioned like the small holes designated W1C and W2C near the NW corner of the pyramid (Ibid., 54, Fig. 10). Those holes are 1 m W of the W pyramid baseline and slightly S of an alignment with the N baseline. The holes at the SW corner, however, look more like level sockets. The deep cutting must indicate that one or two unusually large pavement slabs, necessitating the use of levers, were laid down immediately against the SW corner of the pyramid.

From the extent of our clearing, it was determined that the natural rock floor dips down to a shallow trough, as at the NW corner. The lowest point of the dip, at the end of the rock-cut trench and its extension (Figs. 1, 5, section A-A'), is .512 m below the rock floor along the W side of the casing socle. Along the W side of the trough, there is a linear N-S cutting marking the W edge of emplacements for limestone pavement slabs which once filled and covered the dip. This cutting takes the floor of the trough to a level about .12 m below the natural rock bed of the extant pavement immediately W of this line (Fig. 1).

A large patch of pavement, 4 (E-W) X 9 (N-S) m, is preserved along the S end of the W enclosure wall bed. The tops of these pavement slabs are badly worn - the stone deteriorates into small chips and dust. In spite of this, it seems probable that the pavement followed and preserved the dip to the bedrock floor toward the center of the court and toward the rock-cut trench, as Maragioglio and Rinaldi stated, and contrary to my earlier suggestion that the pavement levelled off the dip (Lehner 1983, 12).

#### Enclosure Wall

The patch of pavement ends on the W along a very straight line which marks the inside limit of the enclosure wall foundation (Fig. 1). The distance from this line to the outside edge of the enclosure wall bed is 3.25 to 3.40 m. The distance varies with the slight irregularities of the raised outer edge of the natural rock bed for the wall. Maragioglio and Rinaldi (1966, 72) state that the foundation of the enclosure wall, consisting of limestone slabs, varied from 3.25 to 3.60 m in width. A piece of one of the foundation slabs is still in place along the W line of the pavement. The distance from this line to the corner of the casing socle is 10.10 m, which agrees with the width of the court

as given by Hölscher (1912, 59).

The level of the enclosure wall bed varies slightly with the different emplacement cuttings for the wall foundation slabs, the greatest variance in this corner being .24 m. Few emplacement cuttings show toward the N at this corner because the rock becomes soft and is badly worn. These cuttings are very prominent at the corner and along the short length of the S wall bed which we cleared. The surface of the natural rock bed in the area we cleared is, on the average, .06 m lower than at the NW corner of the pyramid court on the basis of 19 spot heights taken at both the NW and SW corners.

The raised edge marking the outside of the enclosure wall bed is .16 m high on the S and .09 to .12 m high on the W. The outside edge is cut back by .40 m where it meets the rock-cut trench on the S side. Beginning 5 m from the SW corner along the S side the edge is also either cut or worn back to a rough irregular slope across the corner of the enclosure wall bed. Something similar is seen at the NW corner where the outer edge of the enclosure wall bed is cut back starting at 5 to 6 m from the corner on the W side (Lehner 1985, 53-4, Figs. 9-10). The point of the SW corner of the wall bed is not well defined in the sloping rock, but it can be made out as a rough protrusion which drops down to the corner hole "SW" (Fig. 1).

#### Rock Floor Outside the Enclosure Wall

In the last report it was noted that the NE and SE outside corners of the enclosure wall bed are very worn, making it impossible to study their conditions as left at the time construction of the Khafre Pyramid court was completed. The NW corner had been protected over recent years by a thin cover of debris and suffered little damage since ancient times. When this was cleared last season, the bedrock surface just outside the corner of the enclosure wall bed was notably rough and unfinished. The corner hole, "NW", was shallow and had rough edges. These conditions suggest that the features outside the corner were used in an early stage in the layout and fashioning of the court. The surface around the corners of the court were left in the rough and were never worked smooth (Ibid., 33-34).

A similar situation is found at the outer SW corner of the enclosure wall. The rock floor had been sealed by a deposit (Layer 6, Figs. 2-3) from ancient times, possibly since the 4th Dynasty, until the excavation trench was dug at this corner in the 1960's. The floor outside the corner, which was revealed when the trench was recleared, is remarkably rough, with pronounced irregular knobs and pockets as illustrated in Figs. 2 and 3 (W Balk). On the W side, the outside edge of the enclosure wall bed is defined only by the line where the smoothed and levelled bed gives way to the pocketed floor. On the S side the



very irregular surface outside the wall bed phases out and becomes smoother about 2.5 m E of the corner. The corner hole, "SW", is shallow and irregular, lying .30 m from the rough corner of the wall bed at the bottom of the slope in the rough floor. Further to the N along the W side and beyond the mound of debris (Fig. 1), the rock floor outside the enclosure wall bed is more dressed and slopes evenly away from the edge of the bed, as is the case for most of the N, S. and W sides of the pyramid court.

#### Rock-Cut Holes

Given the limited clearing and mapping of the SW corner this season, very little has been exposed here of the patterning of the rock-cut holes which occur at regular spacings around the pyramid court.

The last visible pair of the two staggered hole-lines on the W outside edge of the enclosure wall bed, designated as the W- and WA series last season, are seen in the top left of Fig. 1. The closest of these to the wall bed, designated W40, was used to establish the hole-line for survey last season (Ibid., 35). The intersection of that line with the S (south) series - our point GII5, falls in the corner hole, "SW". Like corner hole "NW" at the opposite end of the W-line, "SW" is very shallow. The suggestion is that it may have been deeper in an earlier stage of the layout and levelling of the court and wall-bed, before the surface around it was worked down.

At the NW corner there are holes spaced 1 m from the corner hole on both the N and W sides, designated holes NO and WO (Ibid., 54, Fig. 10). There are no holes in equivalent positions near hole "SW." 3 m S of hole "SW" there is a pair of small shallow holes which are .12 to .15 m square (Fig. 1). These do not belong to the series of larger, regularly spaced holes. The split between these two holes lines up with the inside line of the enclosure wall bed as given by the outside line of the extant court pavement to the N. The first hole in the regular S-series is found 6 m E of the corner hole, "SW". It is .22 m in diameter and only .06 to .12 m deep. One of the holes of the WB-series, which runs along the inside of the enclosure wall bed on the W, was exposed between the patch of pavement and the mound of debris (Fig. 1). It is filled with gypsum mortar.

#### Rock-cut Trench

A large trench, cut into the natural rock floor, was cleared and documented at the SW corner of the Khafre Pyramid this season. Similar trenches are found at the other three corners of the pyramid court (Lehner 1983, 9-11). This trench shows similarities to, and marked differences from, the trench at the NW corner which was cleared and documented last season. Fig. 4 is an isometric projection of the two trenches side by side.

Fig. 5 is a series of profiles across the SW corner trench. The positions of the trench and the profiles are shown in Fig. 1.

The W edge of the main part of the SW corner trench is 7.80 m E of the W edge of the enclosure wall bed, and 8 m E of the corner hole, "SW". For comparison, the W edge of the main part of the NW corner trench is about 7.70 m E of the W edge of the enclosure wall bed and 8 m E of the corner hole, "NW". Thus, the earlier value of 7 m from the trenches to the corners of the court (Ibid., 9) is corrected.

Like the trenches at the other three corners of the Khafre Pyramid court, the trench at the SW corner has a deeper, main part, and a shallower and broader extension out to the lowest point in the dip or trough of the bedrock floor at the center of the court.

The main part of the trench cuts across the bed of the enclosure wall. It is 4.24 m long, .79 m wide, and .76 m deep measuring down from the wall-bed. At the upper S edge of the trench, pointing away from the court, there is a depression which is about as wide as the end of the trench (Fig. 5, B-B'). This may be the beginning of a shallow drain like that which extends off the N end of the NW corner trench (Lehner 1985, 40; see Fig. 4 here). At present, the area S of the trench is covered by deposits. The interior S end of the trench is cut into a step, .17 m high (Fig. 5, A-A'). The floor of the trench slopes by about 7 cm to the N. There is no hole in the floor at the end of the trench facing into the court like that found in the NW corner trench (Ibid., 39), but in the floor at this end there is a small irregular depression, perhaps a natural fissure. We had only a brief examination of this end of the trench because the sand which fills it supports "Sound and Light" electrical cables which have been laid across the site.

Small notches, corresponding roughly to the lines of the enclosure wall-bed, were noted along the upper edges of the NW corner trench (Fig. 4). These are not seen at the SW corner trench. Instead, the sides of the trench are cut down by about .25 m into ledges (Fig. 5, C-C'). The ledges begin on the S at the outside line of the enclosure wall and extend N for 1.29 m (E side) and 1.54 m (W side) with a width of .37 to .38 m. The ledges then widen to .58 to .70 m on the E side, and to .50 m on the W side. The ledge on the E supports a limestone block which is 1.62 m long, .60 to .74 m wide, and .30 m thick (Fig. 5, D-D' and E-E'). The top of the block thus protrudes from .05 to .10 m above the enclosure wall bed. There is a square cutting, .12 m deep, out of the SW corner of the block. The ledges on the shoulders of the trench end .57 m short of the N end of the trench. Here a vertical cut, perpendicular to the trench, takes the surface down .13 m lower than the ledges, or .37 m lower than the enclosure wall bed.



This cut is the S end of the broader extension of the trench into the court. The extension is much larger and deeper than the extension of the NW corner trench. At the SW corner the extension forms an irregular rectangle, 5.70 m long and 2.92 to 3.00 m wide. There are three parts to the extension. In the first part of the extension on the S the floor slopes slightly from both the E and W sides to a gentle trough which is E of the axis of the extension (Fig. 5, F-F'). The floor at the S end of this part of the extension is .28 to .35 m higher than the bottom of the main part of the trench. In addition to sloping from the sides, the floor of this part also slopes slightly to the N by about .11 m (Fig. 5, A-A').

3 m from its S end, the floor of the extension drops to its second part. The floor here is .15 m lower than the floor of the first part or .57 m lower than the floor of the court just to the W. The floor of the second part of the extension, which is fairly smooth, is thus at about the same depth as the main part of the trench (Fig. 5, A-A', G-G'). The outline of the second part of the extension is more irregularly cut than the other two parts. It measures 3.15 m (E-W) X 1.50 m (N-S). A wide fissure cuts through the E half of this part of the extension.

The third part of the extension is 2.75 m (E-W) X 2.10 m (N-S). The floor is .27 m higher than the floor of the second part, or .15 m lower than the floor of the court trough at the N end of the extension (Fig. 5, H-H'). As opposed to the floor of the first and second parts, the floor of the third part is rough and uneven. The large fissure, which runs along the E half of the second part, swings to the NW to cut diagonally across the third part of the extension.

The remains of two in situ pavement slabs lie nearly flush to the E side of the extension (Figs. 1; 5, A-A' and F-F'). The surfaces of these slabs are very worn. The SW corner of this patch of pavement has a 90 degree cut, no doubt where another pavement slab once fitted in. The missing slab would have partially covered the extension to the trench. Two small irregular limestone slabs set in gypsum mortar remain in situ in the extension along its E edge next to the pavement slabs. These appear to be the remains of packing which filled the extension and supported the missing pavement slabs (Fig. 5, A-A' and F-F'). The SW corner of the extension meets a larger patch of in situ pavement (Fig. 1). Here, the corner pavement slab has been broken where it meets the extension (Fig. 5, H-H') indicating, again, that the pavement once covered the extension which would have been filled in.

As we cleared the trench and its extension we cut several temporary balks through the sand fill in case there were any undisturbed stratified deposits. Particularly in the deepest part of the extension, the sand appeared comparatively clean and

uncontaminated and contained large spots of granite dust. However, modern inclusions of straw, paper, and glass were always found at the bottom of the fill near the rock floor. A sizable quantity (enough to fill two excavation baskets) of chips, splinters, and large pieces of Egyptian alabaster was recovered from the sand fill at the far SW corner of the third part of the extension where the natural fissure meets the broken pavement (Fig. 1). The largest of these pieces was .50 m thick and about .40 m in diameter. One side of this, and of another large piece, was worked smooth, indicating it had been a part of pavement or some other installation.

#### Observations on the Rock-cut Trench

The natural rock around the Khafre Pyramid was prepared as a bed, about 13.5 m wide, for the limestone slab pavement of the pyramid court and the foundation of the enclosure wall. Since the corner trenches and their extensions are cut into the natural rock, there is the question of whether their purpose was connected with the preliminary layout and preparations of the pyramid and its court, or some other function after the court was paved and the enclosure wall completed. In the first case, the trenches and their extensions may have been filled with mortar and packing and subsequently covered by the enclosure wall and the court pavement. In the second case, these features would have been left open, or with some access through the surface of the court pavement.

Although they did not mention the trenches at the SE and SW corners of the Khafre Pyramid court, Maragioglio and Rinaldi (1966, 72-74) suggested that the trenches at the NE and NW corners were for draining rain water which flowed down into the dips in the court. It has also been suggested (Lehner 1983, 9-11, 14-17) that the trenches were made for a preliminary stage in the original survey and layout of the court and the pyramid. In the last GPMP report, I suggested that the NW corner trench may have been a reservoir, perhaps fitted with blocking to form a kind of sluice gate, for the control of water used as a reference for levelling during the layout operations (Id. 1985, 41-2).

The shallow drain extending from the N end of the NW corner trench (Fig. 4) indicates that water was to be drained away after it had filled the main part of the trench and the extension. The problem is that the water would remain in the trench for a depth of .65 m and in the trough of the court dip at a depth of about .15 m after it stopped draining out the end of the trench. The same is true of the trench at the SW corner. If the depression at the S end of the trench, pointing away from the court, is a drain, water would flow from it only if its level rose above the upper edge of the main part of the trench. It would remain in the trench at a depth of .55 m and in the trough of the court for a depth of .15 m. It would also fill the extension.



There is some indication that the main part of the SW corner trench was not filled with packing, but was covered by pavement, at the completion of the pyramid court. The shoulders along the sides of the trench were cut down into ledges to receive covering blocks, judging by the large limestone block which remains in situ on the E side (Fig. 4). This block hangs out over the edge of the trench by only .10 to .15 m (Fig. 5, D-D', E-E'). A block on the opposite side would have extended out by .67 to meet the extant block and thus completely roof over the trench. But this would have left only .50 to .55 m of the missing block resting on the ledge. It might have been stabilized by abutting to the existing block, or there may have been a space left down the length of the trench between the cover blocks. The top of the in situ block is about .10 m higher than the enclosure wall bed. Nearby to the SE a piece of wall-foundation rests in situ with a thickness of only .10 m (Figs 1; 5, A-A', C-C'). This suggests that the wall-foundation slabs which once adjoined the block were thin enough to meet flush with the top of the block.

Perhaps the trench was left unfilled under the enclosure wall with openings at both ends to be a reservoir of rain water, or water from cleaning the court. Was rain water considered sacred after it washed down the faces of the pyramid? Could the many alabaster fragments which we recovered from the fill of the extension, albeit overturned during recent excavations, be the remains of some special drain or other installation connected with the trench? On the other hand, it should be recalled that the floor at the S end of the NW corner trench retained a thin patch of gypsum which might indicate that it had been filled with limestone/mortar packing, rather than having been left empty at the completion of the pyramid court.

The extension to the SW corner trench may also have been filled with packing and covered with pavement when the pyramid court was completed. This is indicated by the small bit of in situ packing which exists at the E side if the first part of the extension (Figs. 1; 5, A-A', F-F'). The pavement at the NW corner of the extension is broken, and also looks to have once covered the extension. Patches of mortar occurred on the floor of the extension to the NW corner trench, indicating it too may have been filled and paved over.

The extensions of the trenches at all four corners of the pyramid court appear to be secondary, cruder cuttings, executed after the main trench had in each case been formed. At the SW corner the extension is longer, as well as wider, than the trench itself. The second, deepest, part of the extension looks itself to have been cut, or deepened, after the general outlines of the extension were completed.

The correspondence of the positions and other similarities between the NW and SW corner trenches must indicate a common

purpose. At the same time the marked differences between the two suggest variable functions, and ad hoc modifications. The significance of the corner trenches at the Khafre Pyramid has yet to be adequately resolved.

#### 4. MISCELLANEOUS OBSERVATIONS

Small Holes in the Accretion Layers of Pyramid GI-c.

Because one of our main traverse stations is on top of GI-c, the southernmost of the subsidiary pyramids along the E side of the Khufu Pyramid, we had to climb up and down this pyramid many times with our survey equipment in tow. While doing this we noticed the small holes, about .05 m in diameter, which are cut into the tops of the blocks of the accretion layers forming the core of this pyramid. Fig. 6 shows examples of these holes at a. the NE corner, b. the SE corner, and c. the SW corner of the pyramid. Similar holes also occur at a few places along the sides of the core layers. We have not found similar holes on the other subsidiary or main pyramids at Giza.

While a more thorough examination is needed to ascertain the function of these holes, we might speculate that they held small rods for stretching line to control the square and diagonals of the core layers as the pyramid was built.

#### ACKNOWLEDGEMENTS

We are grateful to the Egyptian Antiquities Organization for permitting this research and sponsoring the project under its auspices. We would like to say a special thanks to Dr. Ahmed Kadry, President of the Antiquities Organization for his support. We are also grateful for the assistance of Dr. Mahmoud Abd al-Razak, General Director for Lower Egypt, Mr. Nasif Hassan, Director for Public Relations, and Mr. Ahmed Moussa, Director of Giza and Saqqara. We also acknowledge the advice and assistance of Mr. Zahi Hawass, University of Pennsylvania. We are especially appreciative of the efforts of Ms. Amal Samuel, the official representative of the Egyptian Antiquities Organization, and the help given by all the staff of the Giza Pyramids Inspectorate.

This season of the GPMP was made possible by grants from the Yale University Endowment for Egyptology and the Boston Museum of Fine Arts. We would like to thank Prof. William Kelly Simpson and Dr. Edward Brovasky for their support and guidance. A very special thanks is owed to Mr. Bruce Ludwig, the principal individual contributor to the GPMP, whose financial support ensured the continuity of the Project. Our gratitude also goes out to many other individual contributors who helped to make our research possible. We are indebted to the California Department of Transportation (CALTRANS) for the donation of an electronic



distance measurer and the loan of other surveying equipment.

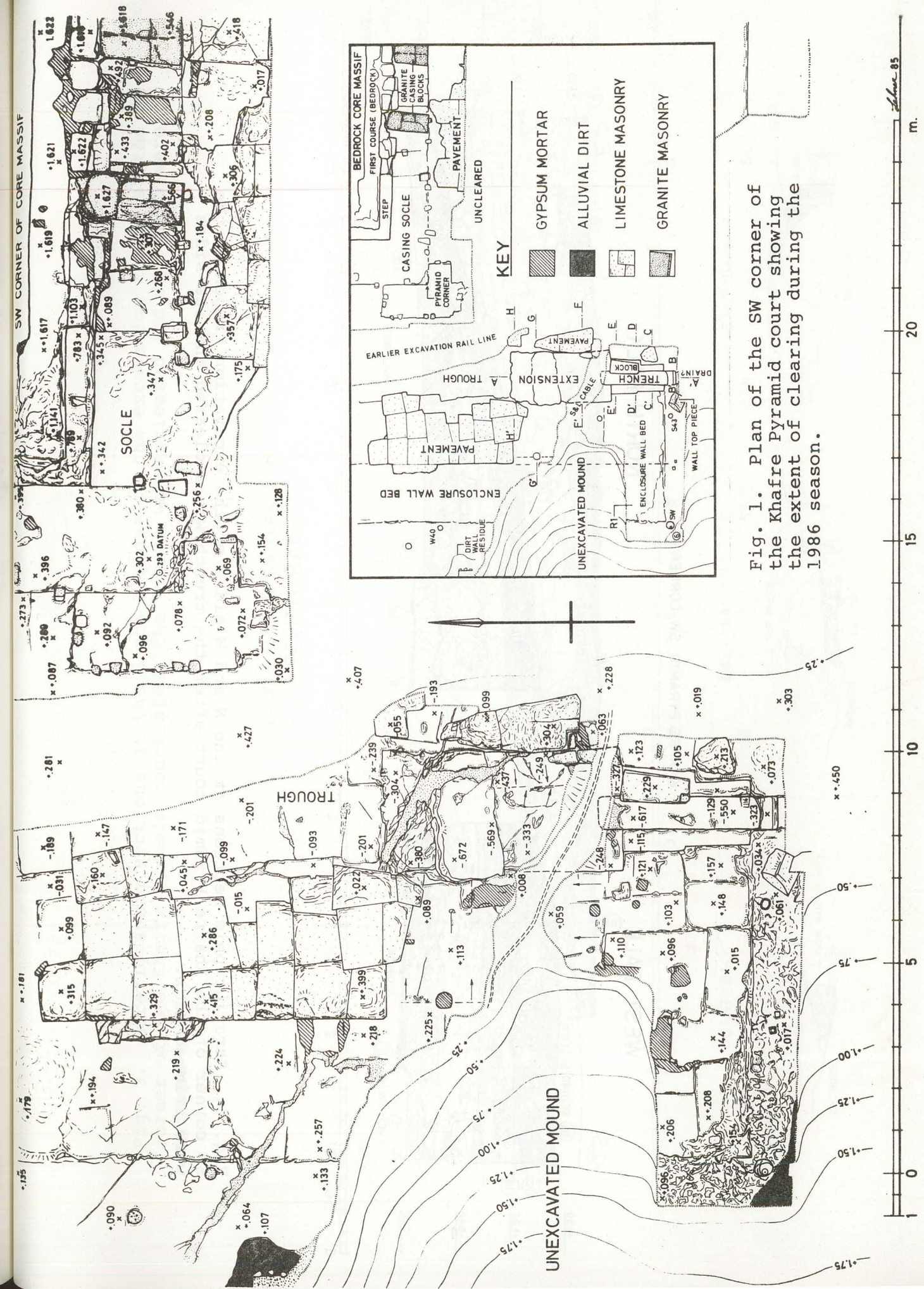
We want to thank the American Research Center in Egypt for sponsoring and expediting the Project through the assistance of Dr. Paul Walker, Dr. Richard Verdery, and Dr. Mary Ellen Lane. A special thanks goes to Ms. Shirley Be for her patient and continuous help from the New York ARCE office.

#### NOTES

(1) I apologize for the fact that Ms. Amal Samuel's name was given incorrectly in the last report of the GPMP (Lehner 1985a). Also, on page 43 of that report it should read that "the top of the quarry grid slopes slightly to the W." In Fig. 10 on page 54 the points located off the outer corner of the enclosure bed which are labelled NEX1-4 should be NW1-4.

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KHAFRE PYRAMID, SW CORNER: R1

WEST BALK

NORTH BALK

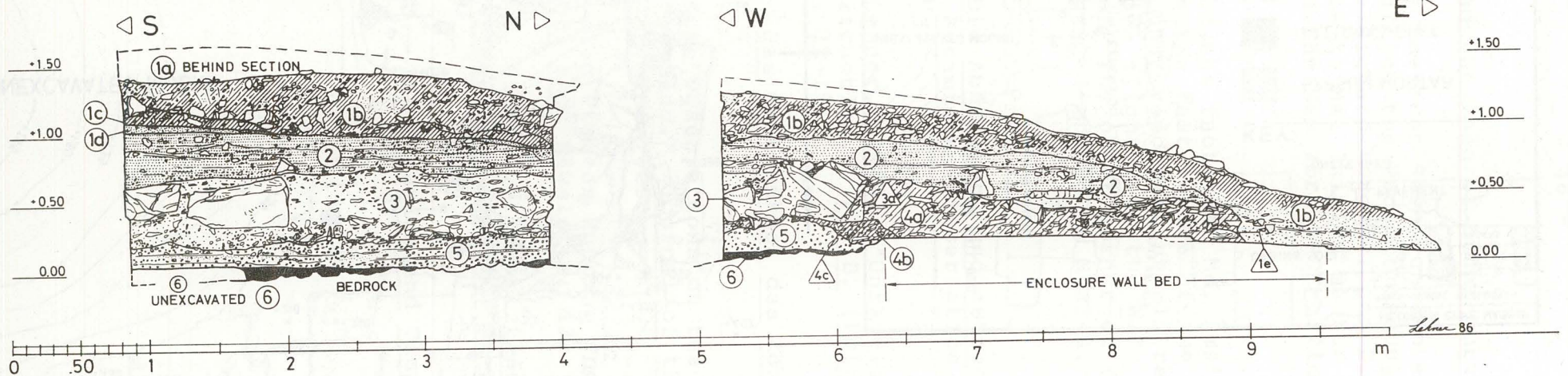
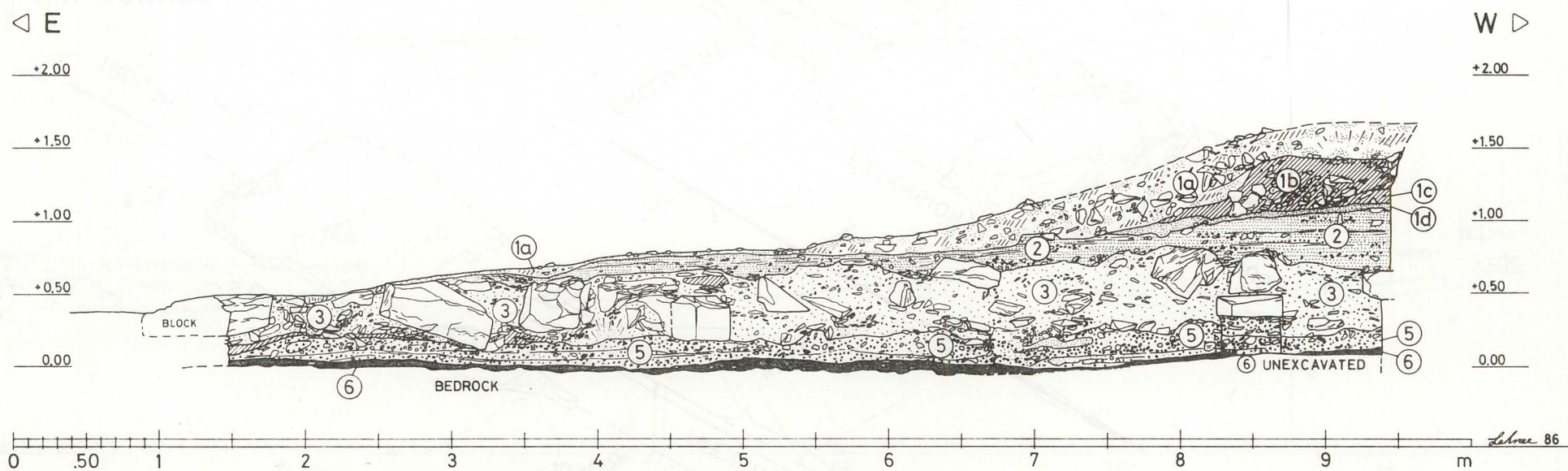


Fig. 2. Stratigraphic sections at the N and W sides of the excavation trench at the SW corner of the Khafre Pyramid court after the trench was recleared and its sides were trimmed back.

Fig. 3. Stratigraphic sections at the S and E sides of the excavation trench at the SW corner of the Khafre Pyramid court after the trench was recleared and its sides were trimmed back.

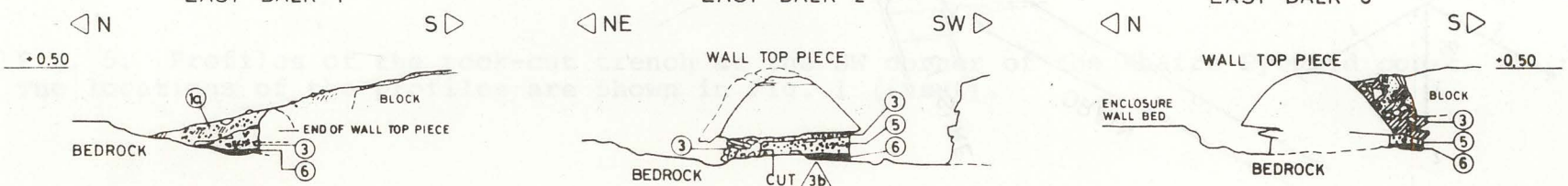
KHAFRE PYRAMID, SW CORNER: R1  
SOUTH BALK



EAST "BALK" 1

EAST "BALK" 2

EAST "BALK" 3





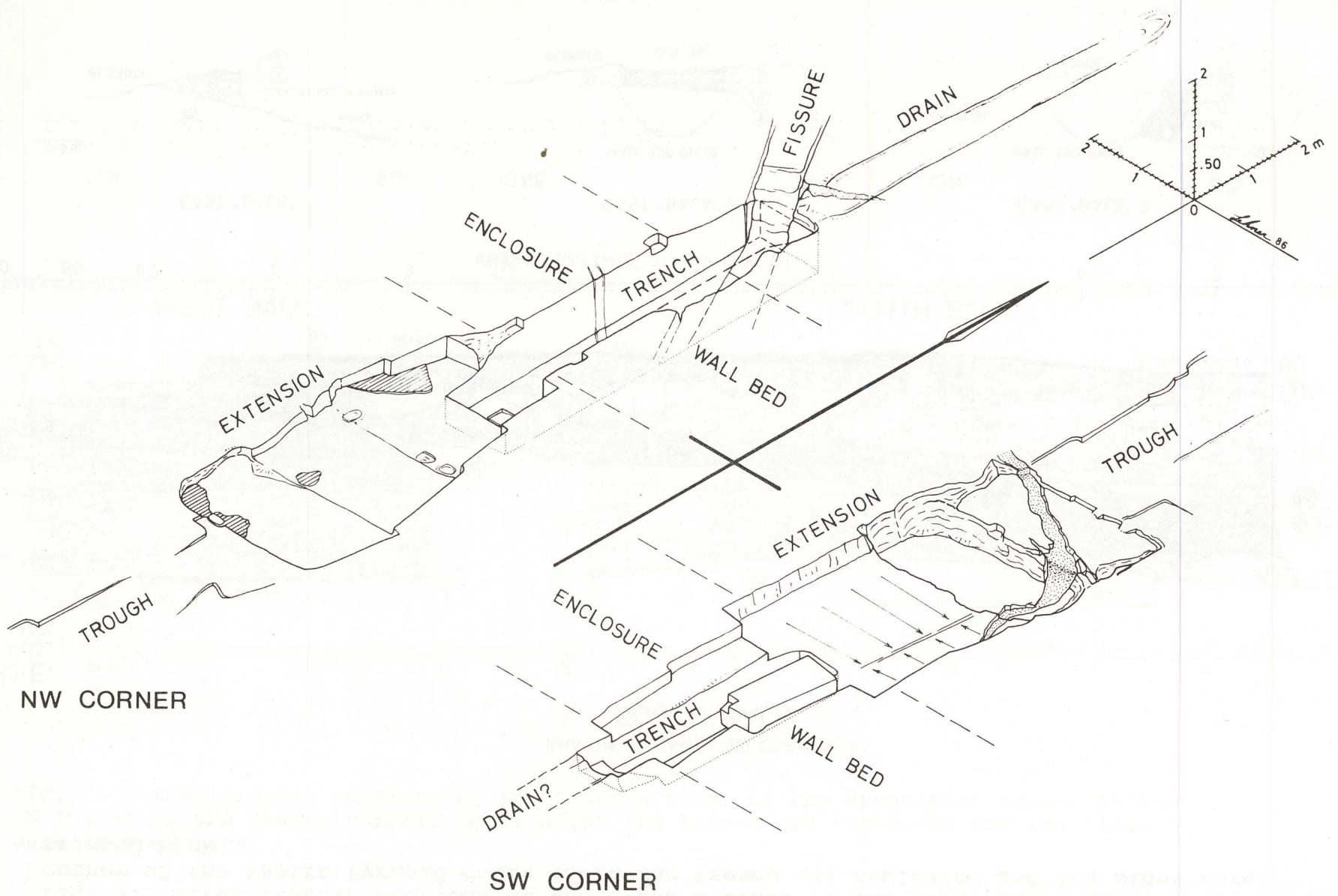


Fig. 4. Isometric projections of the rock-cut trenches at the NW and SW corners of the Khafre Pyramid court.

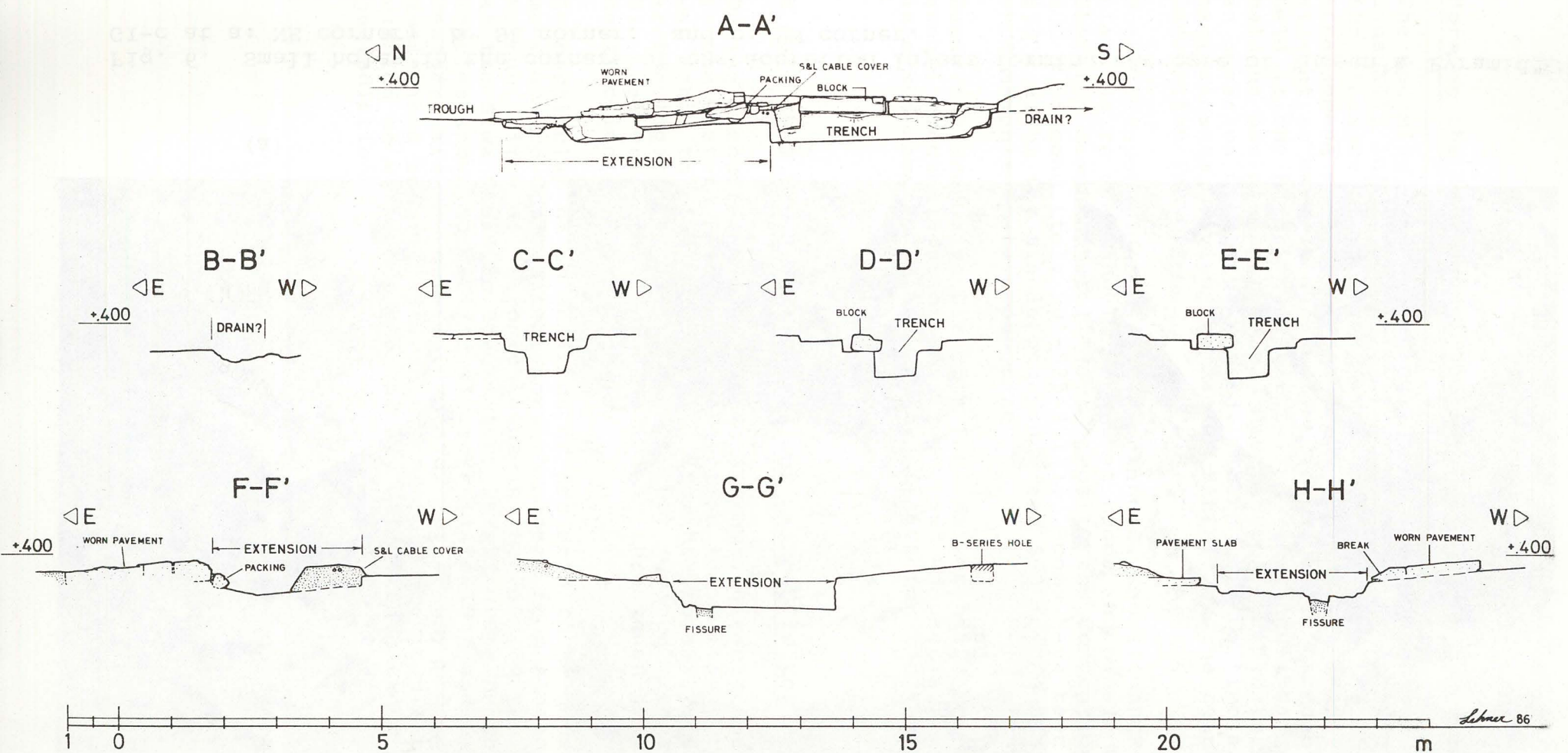
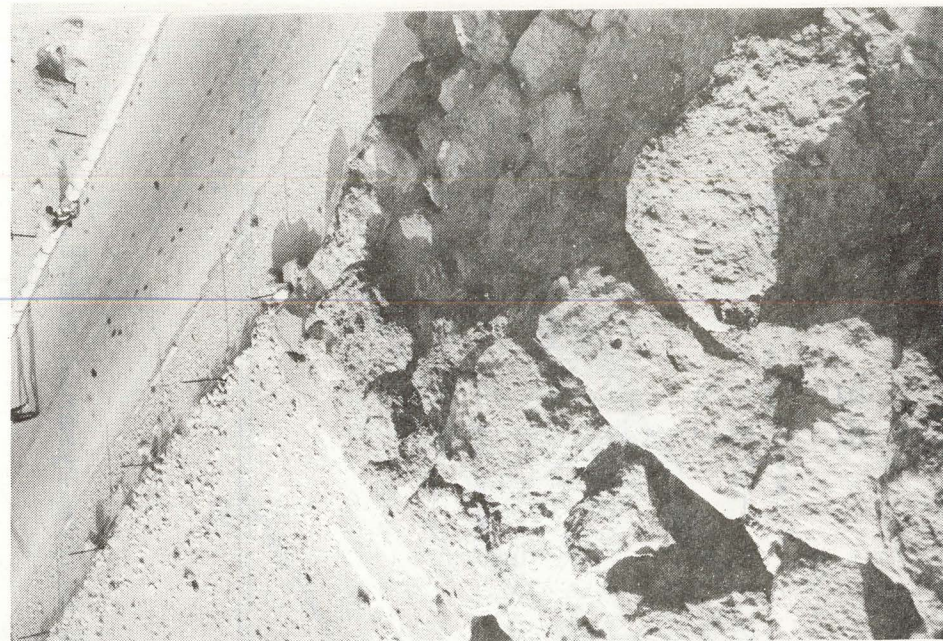


Fig. 5. Profiles of the rock-cut trench at the SW corner of the Khafre Pyramid court. The locations of the profiles are shown in Fig. 1 (inset).





(c)



(b)



(a)

Fig. 6. Small holes in the corners of the accretion layers forming the core of "Queen's Pyramid" GI-c at a: NE corner; b: SE corner; and c: SW corner.

#### More on the 1987 Annual Meeting

The upcoming annual meeting, April 24-26, promises to be an unusually interesting time for all ARCE members who have not had the pleasure of visiting Memphis before, and the local arrangement committee, headed by Prof. Rita Freed, is going all-out to make it a fine time for us all. A reception will be held at the Egyptian Institute, and the annual banquet will be held on one of the fine old Mississippi steamboats. This will be an occasion not to be missed. There will be time as well for participants to view the Ramses Exhibit at the nearby Memphis Convention Center.

Hotel accommodations have been changed, and all ARCE members planning to come should note that rooms and panels will be at the Sheraton Memphis Hotel, just opposite the Convention Center at 300 N. Second (tel: 901-525-2511). Rooms have been guaranteed at \$50 a night for single occupancy and \$60 for double. Ask for the ARCE/Memphis State group rate.

Departing Executive Director Paul Walker has agreed to give the annual banquet address this year, and we can look forward to his informed remarks as a director of ARCE for the last ten years.

#### A Note from Dr. Robert Betts, our Cairo Director

During a courtesy visit to Kamal Fahmy, Director of Excavations in the Western Delta at the Egyptian Antiquities Organization, I was asked to pass on an appeal from him to all potential archaeological expeditions that they seriously consider work in his area which he says is seriously threatened by the permanent destruction of many sites.

In particular he is desirous of projects to be undertaken at the many Graeco-Roman sites along the coast from Alexandria to Mersa Matruh, sites of Pharonic towns in the Kafr Shaykh governate, and at the Siwa Oasis in the Western Desert where he says several temples known to earlier visitors (late 19th and early 20th century) are now covered by sand. Dr. Fahmy promises every assistance and facility on his part to American expeditions wishing to work in these and any other areas under his jurisdiction.



NOTES FROM THE EXECUTIVE DIRECTOR

Mary Ellen Lane Becomes Director of CAORC

The quite extended period since our last newsletter has left us without a proper occasion to announce the departure from ARCE Cairo of Dr. Mary Ellen Lane, director there for development and outreach. As of last July 1st Dr. Lane became head of the Council of American Overseas Research Centers -- an umbrella organization based in Washington, D.C. to coordinate needs and programs we have with those of the other several centers like us. We should note as well as assuming this important new position, Mary Ellen has also become the mother of a baby girl, Julia, born October 11, 1986.

Soon after we began a significant new commitment to private sector fund raising in March of 1982 connected with the award of a National Endowment for the Humanities challenge grant, funds became available for a staff position in Cairo in the area of outreach and development. Dr. Lane was chosen (September 1982) not only as the first person to hold the job but much more important as the very individual to create the whole program itself from scratch. Nothing of the kind existed in Cairo previously. Although some significant fund raising was done before this both there and here, the hard part which involved slowly building a network of social and institutional contacts and goodwill fell to Mary Ellen. Her success in this was quite beyond anything expected. My own visits in Cairo to the Archaeology Club evenings and tours and to meetings of the Executives' Advisory Board were eye openers both as to the tremendous regard for ARCE activities on the part of the Cairo business and diplomatic communities and to the really unusual talents of Dr. Lane in this sphere of work which was, after all, not an obvious part of her academic and scholarly background.

As ARCE finally certifies to the NEH that it has indeed proven itself capable of sustained, long range, private fund raising, a very large part of the credit obviously is due Mary Ellen for her remarkable efforts over almost four years in Cairo.

Dr. Terry Walz Appointed ARCE US Director

After a brief but intense search for a person to fill in at the US office from my leaving until the end of ARCE's lease at Columbia University, June 30, 1987, we were especially fortunate to be able to turn to Dr. Terry Walz, a long time colleague in ARCE activities who combines accomplishments as a scholar with extensive experience in the business world.

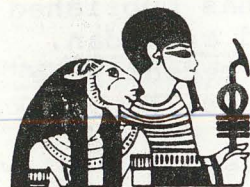
Dr. Walz is a former ARCE fellow with a Ph.D. from Boston University in African and Middle East History. He has published one book length study, Trade Between Egypt and Bilad as-Sudan, 1700-1820 (IFAO, 1978) and numerous articles. Most recently he has served as managing director of Lilian Barber Press, New York.

Paul E. Walker  
New York City  
December 1986



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